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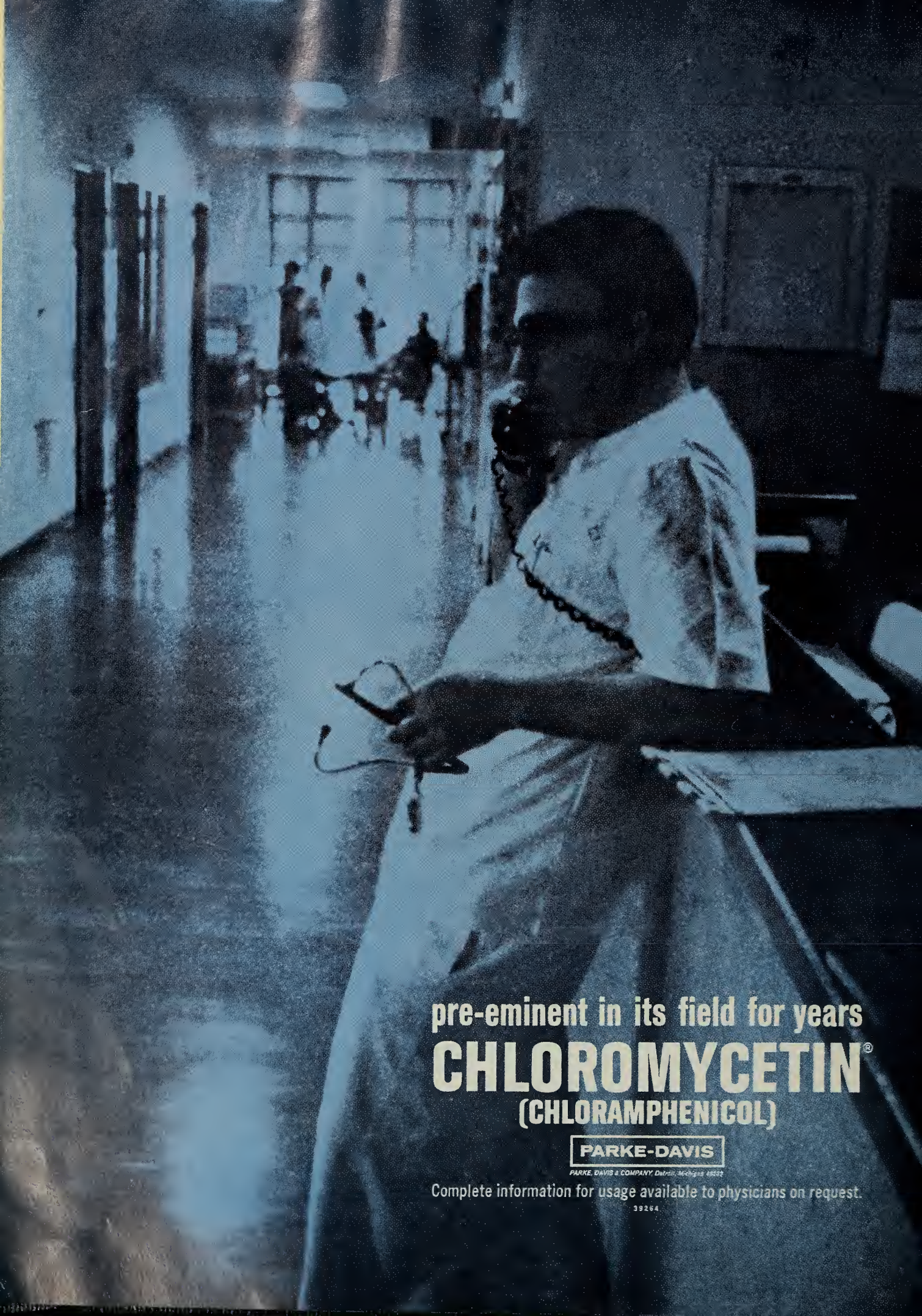
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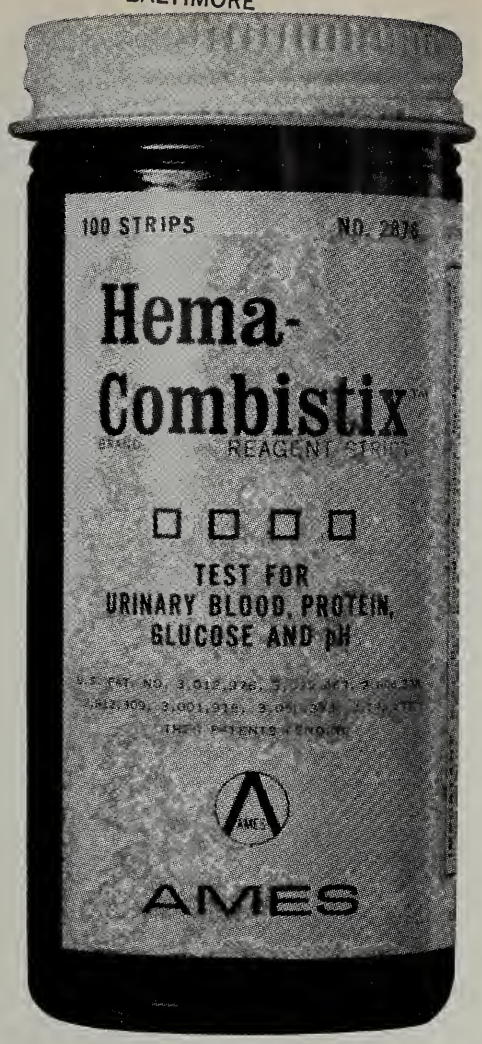
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Victor Richards, San Francisco....1967
CONSULTANT:
Albert C. Daniels, San Francisco

Committee on Scientific Information
Edmund L. Keeney, La Jolla....1965
Stuart C. Knox, Hollywood....1965
Gerson R. Biskind, San Francisco....1966
L. S. Goerke, Los Angeles....1966
Justin J. Stein, Los Angeles (Chmn.)....1967
CONSULTANT:
Edward J. Zaik, Los Angeles

Committee on Maternal and Child Care
Charles M. Blumenfeld, Sacramento....1965
Herbert A. Holden, San Leandro....1965
Saul J. Robinson, San Francisco....1965
Leland B. Blanchard, San Jose....1966
James W. Ravenscroft, San Diego....1966
Russell W. Mapes, Beverly Hills....1967
Keith P. Russell, Los Angeles (Chmn.)....1967
Forrest H. Howard, Santa Ana....1967

Committee on Cancer
Sol R. Baker, Beverly Hills....1965
Walter E. Heck, San Francisco....1965
John G. Walsh, Sacramento....1965
David A. Wood, San Francisco (Chmn.)....1965
Burt L. Davis, Palo Alto....1966
Paul C. Samson, Oakland....1966
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Committee on Cancer Education
Sol R. Baker, Beverly Hills (Chmn.)....1965
Paul H. Deeb, Loma Linda....1965
Robert W. Jamplis, Palo Alto....1965
Maurice Galante, San Francisco....1965
Justin J. Stein, Los Angeles....1965

Committee on Tumor Tissue Registry
E. M. Butt, Los Angeles....1965
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Lewis M. Guiss, Los Angeles....1965
James E. Kahler, Los Angeles....1965
Carl M. McCandless, San Francisco....1965

Committee on Consultative Tumor Boards
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Otto Pflueger, San Francisco....1965
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Dexter T. Ball, Santa Ana....1965
L. Henry Garland, San Francisco....1965
Paul C. Samson, Oakland (Chmn.)....1965
Ray Seavers, Jr., San Bernardino....1965
Jerome A. Weinbaum, Chico....1965
CONSULTANT:
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J. Lafe Ludwig, Los Angeles	(1963-1964)	Harold Kay, Oakland
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Warren L. Bostick, San Rafael	(1964-1965)	Walter H. Brignoli, St. Helena
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Ralph C. Teall, Sacramento	(1964-1965)	Robb Smith, Orange Cove
James C. Doyle, Beverly Hills	(1964-1965)	Homer C. Pheasant, Los Angeles
Wilbur G. Rogers, Glendale	(1964-1965)	Carl M. Hadley, San Bernardino
Charles B. Hudson, Oakland	(1964-1965)	Robert L. Watson, Jr., Los Angeles

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GRaystone 4-1061
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2151 Berkeley Way, Berkeley 94704
Berkeley.....2151 Berkeley Way 94704
THornwall 3-7900
Sacramento.....631 J Street 95814
HIckory 2-4711
Los Angeles.....703 State Building 90012
MAdison 0-2900

Medical Schools in California

University of California School of Medicine, Medical Center, San Francisco 94122. Dean: William O. Reinhardt, M.D.

Stanford University School of Medicine, 300 Pasteur Drive, Palo Alto 94304. Acting Dean: Sidney Raffel, M.D.

University of Southern California School of Medicine, 2025 Zonal Avenue, Los Angeles 90033. Dean: Clayton G. Loosli, M.D.

Loma Linda University, School of Medicine, 1720 Brooklyn Avenue, Los Angeles 90033. Dean: David Burdg Hinshaw, M.D.

University of California at Los Angeles, School of Medicine, Hilgard Avenue, Los Angeles 90024. Dean: Sherman M. Mellinkoff, M.D.

California College of Medicine: 1721 Griffin Avenue, Los Angeles 90031. Dean: Warren L. Bostick, M.D.

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Society secretaries are requested to notify California Medicine promptly when changes are indicated in their roster information

ALAMEDA-CONTRA COSTA Medical Assn., 6230 Claremont Ave., Oakland 94618. Meets quarterly.
Paul H. Cronenwett.....President
6230 Claremont Ave., Oakland 94618
J. Brandon Bassett.....Secretary
2930 McClure St., Oakland 94609

BUTTE-GLENN Medical Society, P. O. Box 1008, Chico 95927. Meets Fourth Thursday.
Jay O. Gibson.....President
170 E. 2nd Ave., Chico 95926
Dale W. Ritter.....Secretary
6 Cohasset Circle, Chico 95926

FORTY FIRST Medical Society, 4775 Santa Monica Blvd., Los Angeles 90029.
Loron N. McGillis.....President
11230 Magnolia Blvd., No. Hollywood 91601
Glenn F. Gordon.....Secretary
1630 Del Valle Ave., Glendale 91208

FRESNO County Medical Society, 2155 Amador, Fresno 93721. Meets Second Tuesday, 6:30 p.m., Sunnyside Country Club.
Norman E. Tostenson.....President
1223 Wishon Ave., Fresno 93728
Joseph B. Ford, Jr. Secretary
2940 Fresno St., Fresno 93721

HUMBOLDT-DEL NORTE County Medical Society. Meets Second Thursday.
Robert Devine.....President
730 7th St., Eureka 95501
Wells Carey.....Secretary
2822 E St., Eureka 95501

IMPERIAL County Medical Society. Meets Second Tuesday, 8 p.m., Pioneer Memorial Hospital, Brawley.
Nathan Wolf.....President
126 Main St., Brawley 92227
Ernest Brock Secretary
200 S. Imperial Ave., Imperial 92251

INYO-MONO County Medical Society. Meets Fourth Tuesday except December, January, February.
D. L. Christenson.....President
380 N. Mt. Whitney Dr., Lone Pine 93545
W. Ray Hartwig.....Secretary
459 West Line, Bishop 93514

KERN County Medical Society, 2603 G Street, Bakersfield 93301. Meets Third Tuesday, 7:30 p.m., Society Office, 2603 G Street, except June, July, August.
Hans E. Einstein.....President
2441 "G" St., Bakersfield 93301
Keith W. Spaulding.....Secretary
2521 "G" St., Bakersfield 93301

KINGS County Medical Society. Meets Second Thursday, 7:00 p.m. Place to be announced.
Clyde Ball.....President
1320 Whitley Ave., Corcoran 93212
Edwin E. Kerr.....Secretary
208 N. Douty St., Hanford 93230

LASSEN-PLUMAS-MODOC-SIERRA County Medical Society. Meets on call.
Lloyd Shannon..... President
P. O. Box 963, Alturas 96101
Robert Haggard.....Secretary
Loyalton, 96118

LOS ANGELES County Medical Assn., 1925 Wilshire Blvd., Los Angeles 90057.
Elmer F. Gooel.....President
1925 Wilshire Blvd., Los Angeles 90057
George C. Andersen.....Secretary
1925 Wilshire Blvd., Los Angeles 90057

MARIN Medical Society, 1601 Second St., Suite 106, San Rafael 94901. Meets First Thursday, 7:00 p.m.
Calvin Plumhof.....President
711 D St., San Rafael 94901
John McGee Secretary
712 D St., San Rafael 94901

MENDOCINO-LAKE County Medical Society.
Thomas Nicholson.....President
408 W. Perkins St., Ukiah 95482
Patrick R. Allanson.....Secretary
728 S. State St., Ukiah 95482

MERCED County Medical Society. Meets Fourth Thursday, Hotel Tioga, Merced.
James A. Parker.....President
535 W. 26th St., Merced 95340
Patrick J. Maloney.....Secretary
656 W. 20th St., Merced 95340

MONTEREY County Medical Society, P. O. Box 308, Salinas 93903. Meets First Thursday.
Osman H. Hull.....President
716 Cass St., Monterey 93940
Joseph E. Turner.....Secretary
1073 Cass St., Monterey 93940

NAPA County Medical Society. Meets Second Wednesday, P. O. Box 658, Napa 94559
E. Paul White, Jr. President
P. O. Box 658, Napa 94559
Richard Clark.....Secretary
1054 Beard Rd., Napa 94558

ORANGE County Medical Association, 300 S. Flower, Orange 92666. Meets First Tuesday, 7:00 p.m.
Hugh J. Plumb, Jr. President
1901 Westcliff Dr., Newport Beach 92663
Laurance A. Mosier.....Secretary
10510 Chapman St., Garden Grove 92640

PLACER-NEVADA County Medical Society. Meets Second Wednesday.
Clifford W. Wauters.....President
701 High St., Auburn 95603
Arthur R. Weaver.....Secretary
701 High St., Auburn 95603

RIVERSIDE County Medical Association, 4175 Brockton Ave., Riverside 92501. Meets Second Monday, 7:30 p.m., Spanish Arts Gallery, Mission Inn.
Donald P. Carpenter.....President
3660 Arlington Ave., Riverside 92506
Richard W. Trotter.....Secretary
6876 Magnolia Ave., Riverside 92506

SACRAMENTO Society for Medical Improvement, 5380 Elvas Ave., Sacramento 95819. Meets Third Tuesday, 8:30 p.m., Sutter Hospital Auditorium.
L. Morgan Boyers.....President
2615 Eye St., Sacramento 95816
James W. Martin.....Secretary
5380 Elvas Ave., Sacramento 95819

SAN BENITO County Medical Society. Meets once a month, except July and August. Time and place to be announced.
Kent S. Taylor.....President
345 5th St., Hollister 95023
Robert D. Quinn.....Secretary
535 Monterey St., Hollister 95023

SAN BERNARDINO County Medical Society, 1875 N. D St., San Bernardino 92405. Meets First Tuesday, 7:30 p.m., Harold's Club, Fontana.
Merlin A. Hendrickson.....President
238 N. Riverside Ave., Rialto 92376
Nicholas P. Krikes.....Secretary
25060 Base Line, San Bernardino 92410

SAN DIEGO County Medical Society, 3427 - 4th Ave., San Diego 92103. Meets Second Tuesday. Location of meetings varies.
Walter R. Nickel.....President
233 A St., San Diego 92101
Purvis L. Martin.....Secretary
2105 5th Ave., San Diego 92101

SAN FRANCISCO Medical Society, 250 Masonic Ave., San Francisco 94118.
John B. Schaupp.....President
250 Masonic Ave., San Francisco 94118
George K. Herzog, Jr.....Secretary
250 Masonic Ave., San Francisco 94118

SAN JOAQUIN County Medical Society. Meets First Thursday, 8:15 p.m., 445 W. Acacia St., P. O. Box 230, Stockton 95201.
James J. Benn, Jr.....President
P.O. Box 230, Stockton 95201
Dora A. Lee.....Secretary
2420 N. California St., Stockton 95204

SAN LUIS OBISPO County Medical Society. Meets Third Saturday, 7:00 p.m., Anderson Hotel, San Luis Obispo 93402.
Richard W. Eells.....President
743 Pismo St., San Luis Obispo 93401
Richard W. Cletsoway.....Secretary
705 Grand Ave., San Luis Obispo 93402

SAN MATEO County Medical Society, 122 El Camino Real, San Mateo 94401. Meets Third Tuesday.
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100 Laurel Ave., San Carlos 94401
Howard W. Lindsey.....Secretary
323 N. San Mateo Dr., San Mateo 94401

SANTA BARBARA County Medical Society, 300 W. Pueblo St., Santa Barbara 93105. Meets Second Monday of the month, University Club, 1332 Santa Barbara St., Santa Barbara.
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300 W. Pueblo St., Santa Barbara 93105
Thurman K. Hill.....Secretary
300 W. Pueblo St., Santa Barbara 93105

SANTA CLARA County Medical Society, 700 Empey Way, San Jose 95128. Meets First Monday.
S. Fred Kaufman.....President
700 Empey Way, San Jose 95128
Jacob M. Stone.....Secretary
700 Empey Way, San Jose 95128

SANTA CRUZ County Medical Society. Meets every Second Month, Second Tuesday. Time, place to be announced.
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850 Main St., Watsonville 95076
John W. Morris.....Secretary
230 Walnut Ave., Santa Cruz 95060

SHASTA-TRINITY County Medical Society. Meets Second Monday of the month. Place to be announced.
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1348 Market St., Redding 96001
Robert G. Taylor.....Secretary
1308 Court St., Redding 96001

SISKIYOU County Medical Society. Meets Sunday on call.
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8 Main St., Weed 94096
Rand Apgood.....Secretary
Medical Center Building, Yreka 96097

SOLANO County Medical Society. Meets Second Tuesday, 8:00 p.m., at different meeting places.
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1200 Marin St., Vallejo 94590
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410 Tennessee St., Vallejo 94590

SONOMA County Medical Society, 576 B Street, Santa Rosa 95401. Meets Second Thursday.
A. A. Thurlow, Jr. President
185 Sotoyome St., Santa Rosa 95405
Tetsuro Fujii.....Secretary
1667 Bloomfield Rd., Sebastopol 95472

STANISLAUS County Medical Society, 303 Downey Ave., Modesto. Meets Third Tuesday of the month, 7 p.m., Hotel Covell, Modesto 95354.
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808 13th St., Modesto 95354
Jeanne I. Miller.....Secretary
709 - 18th St., Modesto 95354

TEHAMA County Medical Society. Meets at call of President.
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343 Oak St., Red Bluff 96080
William L. Weirich.....Secretary
210 S. Main St., Red Bluff 96080

TULARE County Medical Society, 1640 West Mineral King, P. O. Box 16, Visalia 93278.
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P. O. Box 16, Visalia 93278

VENTURA County Medical Society. Meets Second Tuesday each month, 7:30 p.m., Los Posas Country Club, Camarillo.
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302 Glen Ellen Dr., Ventura 93003
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3081 Loma Vista Rd., Ventura 93003

YOLO County Medical Society. Meets First Wednesday.
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Woodland Clinic, Woodland 95675
Samuel C. Houston.....Secretary
3 Court St., Woodland 95695

YUBA-SUTTER-COLUSA County Medical Society, 370 Del Norte Ave., Yuba City 95991. Meets Second Tuesday.
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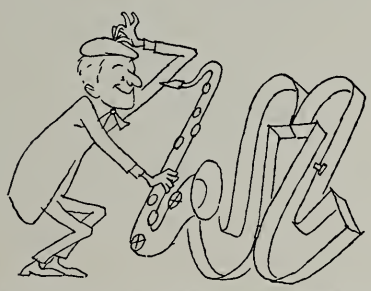
Vertigo couldn't defrost cool Katt.



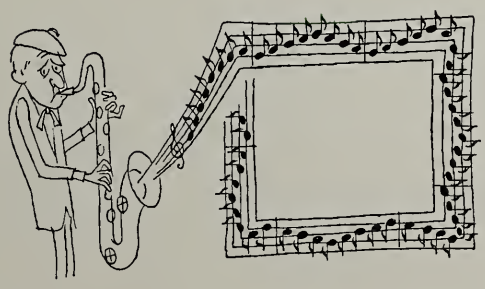
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*Scal, J. C.: Eye Ear Nose & Throat Month. **38**:738 (Sept.) 1959.

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(meclizine HCl, nicotinic acid)

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Birth of U.S. Quintuplets Recorded for Posterity

The birth of the Fischer quintuplets in Aberdeen, S.D., has become part of the medical archives. A case report of the rare multiple birth was published in the June 1 *Journal of the American Medical Association* by Drs. James N. Berbos, Bernard F. King and Albin Janusz, Aberdeen.

In addition to describing the case, the physicians commented that the exact incidence of quintuple pregnancies is difficult to establish but it is apparent that they occur more frequently than has been generally assumed.

"Quintuple pregnancies occur once in every 15 to 20 million births; the incidence in the U.S., based on authenticated reports, is approximately 1.8 million," they said.

Only two complete sets, the Dionnes in Canada and the Diligentis in Argentina, are known to have survived to maturity, they pointed out.

In 1960, it was reported that none of the previous quintuplets delivered in the United States had survived the newborn period.

"While survival beyond infancy is rare, in a case in Kentucky in 1914 one boy lived two years and two others served in World War II," the authors continued. "Others known to have survived the neonatal period include three boys born in Germany in 1907, who reached at least the age of 17, the Prieto quintuplets of Venezuela, born Sept. 7, 1963, and the Fischer quintuplets, born Sept. 14, 1963, in Aberdeen, S.D."

A report published in 1951 included a collection of 71 cases of authentic quintuple pregnancies, they added. If this figure can be accepted as correct and later cases reported from Brazil, Venezuela, and Texas are included, the Aberdeen quints would be the 75th authenticated set. Of these 75, using a study published in 1954 as a base, 18 sets have been born in the United States and two in Canada.

"If this suggests that a disproportionate number of quintuple pregnancies occur in this hemisphere, it is more likely a matter of better reporting than a biological phenomenon," they pointed out.

It has been suggested that a number of factors influence the frequency of multiple births, including fertility of the people which varies in different periods, the number of children a woman bears, frequency of pregnancy, age of the mother, climate, race, and heredity, according to the *Journal* report. Each study on the incidence of multiple births, therefore, can have significance only in terms of the specific population group examined, and the results cannot be extended to a larger group and retain their validity.

Prematurity is the greatest single hazard faced by infants of a multiple birth, the authors added. In the Aberdeen case, they said, at least four of the five infants could be categorized as "mature prematures."

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ECG by Telemetry Clarifies Diagnosis

Electrocardiograms continuously recorded by radiotelemetry have been used to clarify the reasons for recurring fainting spells and have prevented unnecessary surgery in three patients, three Duke University physicians reported.

Four patients with heart block who suffered blackouts were referred to Duke University Medical Center for implantation of electrical pacemakers to correct the problem, according to Drs. Gordon H. Ira, Walter L. Floyd and Edward S. Orgain, Durham, N.C.

However, by continuously monitoring the patients' heart activity, it was learned that the fainting episodes were not related to heart block in three cases and pacemaker implantation was not the appropriate treatment, the authors wrote in the May 25 *Journal of the American Medical Association.*

Continuous monitoring of a 60-year-old woman for nine days revealed that her fainting spells were not associated with changes in heart rhythm. Other studies then uncovered the presence of a tumor in the upper right chamber of the heart. The tumor was removed by surgery and she has had no further fainting spells. Although the patient still has complete heart block, a condition in which the upper and lower heart chambers beat independently, she returned to her normal activities.

By the same process, the fainting spells of a 33-year-old woman were found to be caused by hyperventilation, abnormal deep breathing marked by confusion, dizziness, numbness, and muscular cramps. She was treated without surgery.

Continuous monitoring also helped to find the underlying causes of fainting in a 61-year-old woman who was treated successfully with drugs.

In the fourth patient, continuous monitoring confirmed that heart block was associated with fainting and a pacemaker was successfully implanted.

The radiotelemetry system consists of a small, specially designed battery-powered FM transmitter capable of transmitting the electrocardiographic impulses for 72 hours which is placed on the patient, leaving him completely free to perform any sort of activity without hindrance, the authors explained. The signal is sent to a modified FM receiver where it is taped and can be studied on an oscilloscope and other machines.

Prolonged, uninterrupted recordings of this type were not possible until the miniaturization of electronic equipment allowed the monitored patient free movement.

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California Medicine

Diabetes Insipidus

Treatment with 8-Lysine Vasopressin in a Nasal Spray

SAMUEL B. CHIRMAN, M.D.

LAURANCE W. KINSELL, M.D.

Oakland

■ *Synthetic 8-lysine vasopressin administered as a nasal spray to three patients with diabetes insipidus resulted in excellent control in one. In the other two it was of some value as therapy supplemental to pitressin tannate in oil. The patient who was adequately controlled with "spray therapy" alone required the sprays every three hours during the day, but none during the night.*

SEVERAL AUTHORS[1,2,3,4] have reported their experience in the treatment of diabetes insipidus with the recently synthesized 8-lysine vasopressin, administered in the form of nasal spray.* This preparation, in contrast to the 8-arginine vasopressin which is the natural human antidiuretic hormone, is found normally only in the pig and hippopotamus. Nevertheless, 8-lysine vasopressin has been reported[5] to have pressor and antidiuretic activity in humans nearly equal to that of 8-arginine vasopressin. Our experience with this new preparation in the treatment of three patients with diabetes insipidus is reported in the following three cases.

CASE 1. A 28-year-old white single male newsboy was admitted to Highland-Alameda County Hospital for evaluation following a fall in which he received a frontal linear fracture of the skull. At age two he had undergone partial hypophysectomy for a craniopharyngioma, with near-total blindness resulting. Medical follow-up was scant, but he was able to do well, and grew and was able to partially support himself as a newspaper vendor.

About five years before this admission, he noted increasing thirst and began drinking large amounts of fluids. His intake over the following years approximated five quarts a day. In the spring of 1963, he received intramuscular pituitrin tannate in oil from a private physician and his condition was well controlled on injections self-administered every second to third day. However, the pituitrin caused rectal tenesmus and fecal urgency to the point of near incontinence within minutes of the injection. In addition, he lost nearly 60 pounds of weight over the period of five months that he took the pituitrin.

The patient was 72½ inches tall, weighed 200 pounds and was physically well developed. Juvenile

*Manufactured by Sandoz Pharmaceuticals, Hanover, New Jersey.

Institute for Metabolic Research, Highland-Alameda County Hospital, Oakland.

Submitted February 27, 1964.

facies and habitus were noted. Vital signs were normal. Facial hair was soft, downy and scant, and there was no recession of temporal hair. The brow had a fawn discoloration. Vision was limited to discernment of finger-counting. Body fat was concentrated on the trunk and abdomen, and palpation of the breasts suggested the presence of minimal gynecomastia. Axillary and pubic hair were extremely scant, and the penis and scrotum were small and prepubertal. Testes of about 1 cm in diameter could be palpated.

Blood cell counts, blood urea nitrogen and serum electrolytes were within normal limits. Urinalysis (during discontinuance of pituitrin) showed a specific gravity of 1.001. Protein bound iodine was 3.6 micrograms per 100 ml and radioiodine uptake was 10 per cent in 24 hours. Excretion of urinary 17-ketosteroids was 6.68 mg in 24 hours, and that of urinary 17-hydroxysteroids was 4.55 mg in 24 hours. X-ray films of the skull were within normal limits except for the linear fracture and old craniotomy scars.

Ad libitum fluid intake without treatment varied between 3,500 ml and 8,200 ml per day and urinary specific gravity never rose above 1.002. A Hickey-Hare test confirmed the diagnosis of diabetes insipidus.

In September 1963 administration of 8-lysine vasopressin administered as a nasal spray in a concentration of 50 international units per ml was begun. The drug was administered at first as one spray (about 0.1 to 0.5 ml) in each nostril four times daily. There was no change in fluid intake, and the dosage was gradually increased to two sprays in each nostril every three hours, with pronounced improvement. Finally, the patient was discharged on three sprays in each nostril every three hours. Treatment of pituitary eunuchoidism and hypothyroidism was also begun.

On this regimen the patient was able to maintain his fluid intake at 1,000 to 1,500 ml daily, and with bedtime administration he consistently slept nine hours without drinking or voiding. One vial (5 ml) lasts three to four days. This patient strongly favored the nasal spray to the intramuscular preparation, largely because of the absence of the gastrointestinal side effects associated with the latter preparation. He did not consider the three-hourly schedule of administration an undue burden. At the time of this report there had been no complaint of nasal discomfort or evidence of any nasal irritation.

Case 2. A 38-year-old Negro woman was admitted to Highland-Alameda County Hospital with complaint of progressive thirst, polydipsia and polyuria of six months' duration with intake of eight quarts of fluid per day. Hysterectomy had been done elsewhere (apparently for a non-malignant condition) without complication about five months before the onset of symptoms. Otherwise there had been no illness or emotional or physical trauma antecedent to her condition.

Except for moderate obesity, physical examination was unremarkable. Serum calcium, phosphorus, fasting and post-prandial blood sugars, and x-ray films of the skull were all within normal limits. A Hickey-Hare test, nicotine stimulation test and serum osmolality determination confirmed the diagnosis of diabetes insipidus. The disease was easily controlled with 1 ml of intramuscular pitressin tannate in oil (5 international units) administered every four days.

Shortly after discharge, the medication was changed to the 8-lysine vasopressin nasal spray (50 international units per ml), beginning with one spray (about 0.1 to 0.5 ml) four times daily. Thirst and polyuria persisted until dosage was increased to one spray every three hours. On this regimen, the patient improved at first, and for two nights had only one voiding each night, but fluid intake approached five quarts per day. Evaluation of her complaints and progress was complicated by the patient's unreliability and many emotional problems.

Finally, nurse-administered injections of pitressin tannate were resumed. Although she had been well controlled on the ward, she continued to drink large amounts of fluids, at times up to eight quarts daily, as an outpatient. This abnormality gradually disappeared over several weeks, and she appeared to be reasonably well controlled on pitressin tannate in oil, self-administered every other day.

During the five weeks that the patient took 8-lysine vasopressin there was no complaint or evidence of nasal discomfort or abnormality.

Case 3. A 15-year-old white schoolgirl was referred for evaluation of diabetes insipidus.

At age nine the patient had begun to have pronounced thirst and polyuria without any antecedent illness or trauma. Concentration and dilution tests and a therapeutic trial of intramuscular pitressin tannate in oil confirmed the diagnosis of diabetes insipidus. No other tests of endocrine function were done then. Thereafter she was treated with pitressin tannate in oil, given to her at home by her mother. Control was variable, with administration of the drug required sometimes daily, sometimes at intervals of one week. The principal cause of the variability appeared to be the difficulty experienced by the mother in aspirating and injecting the oily suspension.

A careful historical review and physical examination failed to add pertinent information. The patient was well-developed although thin (61¼ inches tall,

weighing 90 pounds). Protein-bound iodine, serum calcium and phosphorus, fasting and post-prandial blood sugars, and skull and bone age films were all within normal limits. Urinary 17-ketosteroid excretion was 6.22 mg in 24 hours and urinary 17-hydroxysteroid excretion 3.02 mg in 24 hours.

Treatment was started with hydrochlorothiazide, 50 mg twice daily over a two-week period. There was no reduction in pitressin requirement. Then pitressin tannate and the thiazide were discontinued and 8-lysine vasopressin nasal spray (50 international units per ml) was begun in a dose of one spray (about 0.1 to 0.5 ml) in each nostril four times daily, with instructions to increase the frequency of application sufficiently to obtain good control.

After one week, the patient stabilized spontaneously on a regimen of one spray in each nostril every three hours during the daytime. On one occasion she was able to sleep 12 hours without difficulty, but usually she required application two to three times each night to prevent excessive thirst. After several weeks of this regimen, she requested a return to pitressin tannate treatment, having found the nasal spray too cumbersome and somewhat embarrassing to use in front of her schoolmates. At last report she used the nasal spray only to supplement the injectable pitressin at times when thirst developed and the patient's mother was not present to give the injection. During the time the patient used the spray there was no complaint nor evidence of nasal discomfort or other abnormality.

Discussion

Elimination of the need for frequent intramuscular injection of an oily suspension in the management of patients with diabetes insipidus would be most desirable. Intranasal application of the material above described appears to provide adequate control in some patients, but to be inadequate in others, with particular respect to nocturnal control of thirst and polyuria.

Sjoberg and Luft[3] and Fraser and Scott[2] encountered patients similar to those described by us, who required very frequent nasal application. However, they indicated that some persons with milder forms of the disease may be adequately controlled with applications at intervals of six to eight hours. Very possibly the availability of more concentrated solutions will add to the usefulness of this material.

The Institute for Metabolic Research, Highland-Alameda County Hospital, 2701 - 14th Avenue, Oakland, California 94606 (Kinsell).

REFERENCES

1. Baltrop, D.: Diabetes insipidus treated with synthetic lysine vasopressin, Lancet, 2:276-278, Aug. 10, 1963.

2. Fraser, R., and Scott, D. J.: Nasal spray of synthetic vasopressin for the treatment of diabetes insipidus, Lancet, 1:1159, May 25, 1963.

3. Sjoberg, H., and Luft, R.: Nasal spray of synthetic vasopressin for the treatment of diabetes insipidus, Lancet, 1:1159-1160, May 25, 1963.

4. Spiegelman, A. R.: Treatment of diabetes insipidus with synthetic vasopressin, J.A.M.A., 184:657-658, May 25, 1963.

5. 8-Lysine Vasopressin, pamphlet published by the Medical Department, Sandoz Pharmaceuticals, Hanover, New Jersey, Oct. 1962.



Allergic Reactions to Drugs

A Survey on Hospital Practices of Soliciting Medical Information from Newly Admitted Patients

DON HARPER MILLS, M.D., LL.B., *Los Angeles*

■ *The matter of allergic reaction to drugs is causing serious medicolegal problems in hospitals to both physicians and hospitals. This survey seeks to alert the medical profession and hospitals to the problem, what is being done to cope with it in some hospitals, and to emphasize that the duty to make necessary inquiries belongs primarily to the medical profession.*

The form described at the end of this report is a suggestion and is not intended to be reproduced and used in all instances. The medical staff and administration of each hospital should develop a form that is appropriate for its use.

BECAUSE OF AN apparent increase in frequency and seriousness of allergic reactions to drugs, some hospitals have undertaken to share the responsibility of prevention. It has been learned that these hospitals are determining from newly admitted patients whether or not they have knowledge of previous reactions to drugs and whether or not they have recently been taking certain drugs. Traditionally, the duty for such inquiries belongs to the medical profession. While not relieving the medical profession of its responsibility, these hospitals are creating certain legal hazards for themselves; however, there can be little doubt that such action will ultimately enure to the benefit of their patients.

To ascertain (1) how widespread is this trend, (2) whether or not uniformity should be encouraged and (3) whether or not the methods can be refined or improved, the Joint Medicolegal Education Committee of the California Hospital Association and California Medical Association requested a survey of member hospitals in California. This article represents the results and recommendations.

Assistant Clinical Professor of Forensic Medicine and Pathology, University of Southern California.

Submitted May 6, 1964.

Methods and Materials

On March 1, 1963, 450 questionnaires were mailed to member hospitals of all classes. By May 1, 1963, 340 (75.5%) were returned. After thorough evaluation, only 8 of these had to be discarded, leaving a working number of 332 (73.7%). The interest in this study was a major factor for the excellent response.

The questionnaire contained the following items:

1. Is it the policy or practice of your hospital to require designated employees to solicit specific medical information [(1) drugs recently taken and (2) allergies, particularly to drugs] from newly admitted patients?

2. What class of employee has been designated to acquire this information?

3. What is the extent of information solicited?
 (a) Drugs recently taken by patients, particularly antibiotics and steroids?

(b) Allergies, particularly to drugs?

4. Where is this information entered on the hospital chart?

5. Do you utilize a particular form or a rubber stamped outline which is to be filled out by the employee or the patient? (A sample was requested.)

6. When did your hospital initiate this procedure?

7. If known, briefly outline the reasons for initiating this procedure.

Results

1. 229 (69.0%) responding hospitals do have a policy or practice of requiring designated employees to solicit from newly admitted patients specific medical information concerning allergies and/or drugs recently taken. 103 (31.0%) replied negatively; however, 7 of these submitted checklists to be completed by the attending physician (not an employee). All hospitals submitting preoperative or preanesthetic checklists were counted as negative replies unless it could be determined that questions on allergies and drugs, in addition to the items on the checklists, are asked of all patients.

2. The affirmatively replying hospitals were readily divided into three distinct categories with respect to the class or classes of employees which have been designated to obtain this information:

CATEGORY A. 171 hospitals (74.7% of affirmatively replying hospitals and 51.5% of all reporting hospitals) designated nonphysician employees only. These are: registered nurses (161), clerks (28), licensed vocational nurses (LVN) or aides (25), miscellaneous (5) and combinations (41).

CATEGORY B. 42 hospitals (18.3% of affirmatively replying hospitals and 12.7% of all reporting hospitals) designated physician-employees only. They are: interns and residents (17), residents only (14), interns only (5), house staff physicians (5) and Fellow (1).

CATEGORY C. 16 hospitals (7.0% of affirmatively replying hospitals and 4.8% of all reporting hospitals) designated both physician and nonphysician (mixed) employees. They are: nurse and resident (6), nurse and intern/resident (5), nurse and intern (2), nurse and house staff physician (1), nurse, clerk and intern/resident (1) and extern and intern (1).

Hospitals represented in Category B (information sought by physician employees only) are predominantly of the tax supported variety (26 of 42). The opposite was found in the other groups.

To be seen below, the category by designated employee correlates closely with the type of information sought and how it is sought; therefore, most of the remaining statistics will be presented by category.

3. With respect to information sought by designated employees, differences exist as to the kind of information asked for, particularly between allergies and drugs recently taken, which require separate consideration.

a. Designated employees of all 229 affirmatively reporting hospitals (69.0% of all reporting hospitals) seek *some* information concerning allergies.

Inquiry By	*Number of Hospitals*	*Percent of Affirmatively Reporting Hospitals of Same Class*	*Percent of All Reporting Hospitals*
Nonphysician	171	100	51.5
Physician	42	100	12.7
Mixed	16	100	4.8
Total	229	100	69.0

b. Designated employees of only 128 (55.9%) affirmatively reporting hospitals (38.5% of all reporting hospitals) seek *some* information concerning drugs recently taken.

Inquiry By	*Number of Hospitals*	*Percent of Affirmatively Reporting Hospitals of Same Class*	*Percent of All Reporting Hospitals*
Nonphysician	72	42.1	21.7
Physician	41	97.6	12.3
Mixed	15	93.8	4.5
Total	128	55.9	38.5

Comment: Nearly all hospitals designating physician or mixed employees require information on allergies *and* drugs recently taken. In the nonphysician class, the number is sharply reduced with respect to drugs recently taken.

c. Where it can be determined, most information on allergies is sought by general questions.

Inquiry By	*Form of Questions:*		
	General	*Specific*	*Undetermined*
Nonphysician	55	19	97
Physician	2	2	38
Mixed	1	2	13
Total	58	23	148

d. Where it can be determined, most information on drugs recently taken is sought by specific questions.

Inquiry By	*Form of Questions:*		
	General	*Specific*	*Undetermined*
Nonphysician	6	26	40
Physician	0	3	38
Mixed	2	0	13
Total	8	29	91

Comment: General questions are limited to nonspecific classifications: "Are you allergic to any foods or drugs?"; "Have you taken any drugs recently?" Specific questions contain one or more drugs identifiable by name or by genus. Questions were classified as undetermined if the submitted questionnaire was answered affirmatively with respect to items 3 (a) and/or 3 (b), but without further refinement or disclosure of exact question form.

4. Except for specific checklists, there is little uniformity as to where the information sought is preserved for use. The following is a tabulation, according to designated employee class, of the sites of entry and their incidence.

Location of Recorded Information	Inquiry By: Nonphysician Employees 171 Hospitals	Physician Employees 42 Hospitals	Mixed Physicians and Nonphysicians 16 Hospitals
Nurses Notes	88	3	8
Kardex/Rand	28		3
Order Sheet	24	8	5
Medical History	7	36	14
Identaband	4		
Progress Notes	3	5	1
Treatment Sheet	2		
Anesthetic Record		1	...
Patient's Bed	1		
Others	26		
Cover/Holder of chart *in addition* to one or more of the above	101	17	14
Cover/Holder of chart *exclusively*	17	1	
Nurses Station *exclusively*	1		

5. In an effort to determine exactly what is asked of patients concerning allergies and/or drugs recently taken, and how such information, both positive and negative, is recorded, the hospitals were requested to submit specific forms or outlines, if any, which are used for this purpose. 76 hospitals (22.9% of all reporting hospitals and 33.2% of all affirmatively reporting hospitals) indicated that a form or outline is utilized; however, only 70 were submitted for review. Some hospitals submitted stickers which are usually placed on the chart cover or holder. These were not counted affirmatively since it appeared such stickers are not used in the absence of allergy. Great variety exists in the forms and outlines. Some are elaborate and detailed checklists. Others consist of nothing more than a printed question, "Allergies?" followed by a blank space. These were counted affirmatively since it appeared that they require a recorded answer, one way or another.

a. As noted previously, all 229 affirmatively reporting hospitals (69.0% of all reporting hospitals) indicated that *some* information is sought concerning allergies. 75 hospitals (32.8% of affirmatively reporting hospitals and 22.6% of all reporting hospitals) disclosed the use of specific forms or outlines for allergies.

Inquiry By	Number of Hospitals Asking About Allergies	Number Using Forms for Inquiry	Percent Using Forms or Outlines
Nonphysician	171	69	40.4
Physician	42	3	7.1
Mixed	16	3	18.8
Total	229	75	32.8

b. As noted previously, only 128 (55.9%) of the affirmatively reporting hospitals (38.5% of all reporting hospitals) indicated that *some* information is sought concerning drugs recently taken. Of these, 33 (25.8%) hospitals (9.9% of all reporting hospitals) disclosed the use of specific forms or outlines for drugs recently taken.

Inquiry By	Number of Hospitals Asking About Drugs	Number Using Forms for Inquiry	Percent Using Forms or Outlines
Nonphysician	72	30	41.7
Physician	41	1	2.4
Mixed	15	2	13.3
Total	128	33	25.8

c. 32 hospitals (42.1% of all hospitals utilizing forms or outlines for allergies or drugs recently taken) indicated that the forms or outlines covered both topics.

Inquiry By	Number Using Forms or Outlines Covering Both Allergies and Drugs	Number Using Forms or Outlines Limited to One Topic	Percent Using Combined Forms or Outlines
Nonphysician	29	41	41.4
Physician	1	2	33.3
Mixed	2	1	66.7
Total	32	44	42.1

d. As noted previously, where it can be determined, most information on allergies is sought by general questions. This observation is also true for the submitted forms and outlines on allergies (72.5%).

Inquiry By	Number Using Form: Form of Questions: General	Specific	Percent General Questions
Nonphysician	46	17	73 0
Physician	2	1	66.7
Mixed	2	1	66.7
Total	50	19	72.5

e. As noted previously, where it can be determined, most information on drugs recently taken is sought by specific questions. This observation is also true for the submitted forms and outlines on drugs recently taken (81.5%).

Inquiry By	Number Using Form: Form of Questions: General	Specific	Percent Specific Questions
Nonphysician	4	20	83.3
Physician	0	1	100.0
Mixed	1	1	50.0
Total	5	22	81.5

f. The identification and incidence of specific items found on the submitted forms and outlines for allergies are:

Penicillin	16
Narcotics/morphine	11
Novocain (procaine)	6
Aspirin	5
Antibiotics	5
Sulfa drugs	4
Codeine	4
Serum (TAT)	4
Adhesive tape	3
Merthiolate/Mercurochrome	3
Demerol (Meperidine)	2
Cosmetics	2
Eggs	2
Chocolate	2
Milk	2
Streptomycin	2
Tetracycline	1
Achromycin	1
Dyes used in x-rays	1
Total	76

g. The identification and incidence of specific items found on the submitted forms and outlines for drugs recently taken are:

Cortisone	27
ACTH	15
Tranquilizer	10
Hypotensives	7
Digitalis	3
Barbiturates/sedatives	3
Anticoagulants	3
Aspirin	2
Desiccated thyroid	2
Isotopes	1
Medication for asthma	1
Total	74

6. While some hospitals for many years have been requiring their employees to interrogate newly admitted patients on the topics of allergies and/or drugs recently taken, it appears that the majority have initiated this procedure in the last 5 years.

Year	*Number of Hospitals Initiating the Procedure*
1963	3
1962	33
1961	33
1960	23
1959	17
1958	19
1957	8
1956	5
1955	5
1954	3
Before 1954	23
Total	172
No date given	24
"Unknown"	11
"Since the beginning"	18
"Years ago"	4
Total	57

7. Each of 145 affirmatively reporting hospitals listed one or more relevant reasons for initiating the policy or practice of requiring designated employees to obtain from newly admitted patients information on allergies and/or drugs recently taken. They can be divided into the following general categories:

To protect the patient	60
Because of past experience with reactions or publicity about reactions	26
To help the doctors	25
Requested by doctors	20
Because it is good practice	19
To protect the hospital	13
Total	163
"Unknown" or irrelevant reasons given (i.e., "To see if patient is allergic"	36
No reason stated	48
Total	84

Sixteen hospitals which have not initiated this policy or practice volunteered the reason for not doing so by stating that the acquisition of such medical information is the responsibility of the doctor.

Discussion

Sixty-nine per cent of reporting hospitals require their employees to obtain information on allergies from newly admitted patients. Thirty-eight and one-half per cent have a similar policy for drugs recently taken. The disparity is probably due to the greater notoriety of allergic reactions as compared with untoward results of drug interactions. Additionally, while general problems of allergy have been known for a long time, the problems of drug interaction, particularly in surgical patients, have received increasing attention only recently. The present incidence of asking about allergies is sufficient to warrant consideration by all hospitals.

Only considerations of time, availability of personnel and possible hospital liability loom as deterrents to uniformity among hospitals with respect to such practices. With respect to time required for available employees to inquire and record this information, each hospital must decide on the basis of its own special circumstances. As to potential hospital liability there is little question that the assumption of this duty increases the risk to hospitals whenever an error is made; however, it is probable the practices referred to herein will benefit, rather than harm the hospitals, by reducing the occurrences of untoward reactions. It must be emphasized that solicitation of information on these topics by the hospital does not relieve the treating physician of his primary responsibility of checking the answers and of inquiring further when indicated. This constitutes a sharing, not a transference, of duties.

If indeed it would be beneficial for most hospitals to undertake the practice of soliciting information on allergies and drugs recently taken, it would be

FOR PATIENT'S PROTECTION

(To be completed and inserted in front of chart)

1. *Allergies and Sensitivities:* Is there a history of skin or other untoward reaction or sickness following injection or oral administration of:

	Circle One			*What Drug or Food?*
Penicillin or other antibiotics	Yes	No	Don't Know	———
Morphine, Codeine, Demerol or other narcotics	Yes	No	Don't Know	———
Novocain or other anesthetics	Yes	No	Don't Know	———
Aspirin, empirin or other pain remedies	Yes	No	Don't Know	———
Sulfa drugs	Yes	No	Don't Know	———
Tetanus antitoxin or other serums	Yes	No	Don't Know	———
Adhesive tape	Yes	No	Don't Know	———
Iodine or merthiolate	Yes	No	Don't Know	———
Any other drug or medication	Yes	No	Don't Know	———
Any foods, such as egg, milk or chocolate	Yes	No	Don't Know	———

2. *Drugs Recently Taken:* Within the past six months has the patient taken:

Cortisone	Yes	No	Don't Know
ACTH	Yes	No	Don't Know
Anticoagulants	Yes	No	Don't Know
Tranquilizers	Yes	No	Don't Know
Hypotensives (high blood pressure medicines)	Yes	No	Don't Know
Has the patient *ever* received treatment for asthma, rheumatism or rheumatic fever?	Yes	No	Don't Know

Source of information, if other than patient:

Signature of person acquiring this information: Date:

wise to develop a standard procedure. The present survey showed little uniformity in method of solicitation and in location of records. A major factor may be the relatively recent initiation of such practices in many hospitals, with inadequate time for proper evaluation.

Although 74.7 per cent of hospitals already soliciting information on allergies and 56.3 per cent of those already soliciting information on drugs recently taken designate only non-physician employees to carry out these tasks, there is no basis to conclude from the survey itself that one class of employee would be better than another for this purpose. However, after review by the Joint Medicolegal Education Committee, it is recommended that the task of inquiring be limited to medical and nursing personnel.

Uniformity of questioning and of recording would be gained by the use of some type of permanent checklist (such as, for example, the suggested sample form printed above). This should minimize the chance of omission while offering better availability of the information, both positive and negative. At present only one-third of all hospitals use forms or outlines, and many of these are skimpy and irregularly located.

With the accumulated information derived from this survey a checklist was composed which, when properly completed, can be placed permanently inside the front cover of the patient's chart. All affirmative answers to allergies might also be noted on a sticker on the face of the chart cover or holder and at the nurses' station.

Since circumstances vary among hospitals, the suggestions made here must be evaluated in each hospital in the light of local conditions. It is the responsibility of the medical staff of each hospital to determine the propriety of initiating any such hospital function, the extent of information to be sought, the method of solicitation and the location of the information received.

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Recurrent Infections and Immune Deficient States in Children

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■ *Six types of immune deficient states have been identified in children. These are characterized by recurrent bacterial infections due in part to the lack of synthesis of serum immunoglobulins. In this paper the nomenclature, metabolism and function of the immunoglobulins are reviewed. When interpreted according to the age of the patient, the results of serum electrophoresis and immunoelectrophoresis establish the diagnosis of an immunoglobulin deficiency state. Replacement therapy with monthly injections of gamma globulin is necessary in such conditions.*

RESISTANCE TO INFECTION in children is dependent on multiple factors. The inoculum and virulence of the infecting agent is normally opposed by cellular and humoral defenses. Among the cellular defenses are the integrity of the skin and mucous membranes, filtration processes in the reticuloendothelial system, phagocytosis by polymorphonuclear leukocytes and, finally, healing, fibrosis and isolation. Humoral defenses include nonspecific complement, beta-lysin, and properdin, and the specific immunoglobulin antibodies and antitoxins of the human serum.

This report presents the clinical profiles of two male children with recurrent infections and a defect in synthesis of specific serum immunoglobulins. It discusses methods for detection and treatment of such patients and reviews the nature and function of the immunoglobulins.

Reports of Cases

CASE 1. The patient, a boy, was the product of a full-term, normal pregnancy and delivery. His birth weight was 6 pounds 5 ounces. No abnormalities were noted on neonatal examination. A male sibling had died at three years of age of septicemia associated with cyclic neutropenia and agammaglobulinemia. At nine months of age the patient had bacterial meningitis and was found to have agammaglobulinemia. Monthly injections of 10 ml of intramuscular gamma globulin were begun. He progressed well until four years of age, when rheumatoid arthritis developed. This was treated with weekly injections of corticotropin. Subsequently, the patient received irregular medical care. At eight and a half years of age he was referred to the University of California Medical Center in Los Angeles for study, because of frequent otitis media, chronic blepharitis and recurrent pneumonia.

On physical examination he appeared chronically ill with a nonproductive cough. The anterior-posterior diameter of the chest was increased and the abdomen was distended. The abdominal organs were not enlarged. Slight fusiform swelling was present in the interphalangeal joints of both hands. Laboratory data are shown in Table 1. Significant findings were low zinc turbidity, absence of isohemagglutinins, low serum gamma globulin determination on paper electrophoresis, absent $gamma_2$ and weak $beta_2A$ and $beta_2M$ bands on immunoelectrophoresis.

The symptoms of acute infection subsided following antibiotic therapy; 24 ml of gamma globulin was given intramuscularly. The patient was doing well when last observed six months after discharge.

CASE 2. The patient was a boy born at term after normal pregnancy and delivery. The birth weight was 8 pounds 4 ounces. No abnormality was noted on neonatal examination. At six weeks of age, he was referred to the University of California Medical

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Submitted February 7, 1964.

TABLE 1.—*Laboratory Data*

	CASE 1		CASE 2	
Family History	One male sib died of septicemia, age 3 years, with cyclic neutropenia and agammaglobulinemia.		Two male sibs died at six and five months of systemic monilia and vaccinia disseminata respectively.	
Present Age	8½ years.		Death at 10 months.	
Laboratory Data:	*Admission*	*Discharge*	*Admission*	*Terminally*
Hematologic	Hgb 13	11.5	Hgb 12	11.4
	WBC 27,000	12,900	WBC 18,900	23,300
	Seg. Neut. 85	62	Seg. Neut. 63	58
	Band. Neut. 4	2	Band. Neut. 3	6
	Eos. ..	7	Eos. ..	2
	Baso. ..	..	Baso. ..	..
	Lymphs. 4	24	Lymphs. 29	22
	Monos. 7	5	Monos. 5	12
	Platelets adequate	adequate	Platelets adequate	adequate
Chemical	Ca 10.4 mg%		Ca 5.4 mEq/l	
	Alk. P'ase 15 K.U.		P 3.7 mEq/l	
	TSP 5.9 gm% (4.0:1.9)		Alk. P'ase 10 K.U.	
	Carotene 228 mcg%		TSP 5.3 gm% (3.9:2.1)	
	Fe 16.4 mcg%		SGOT 42	
	TIBC 320 mcg%		SGPT 20	
			Bilirubin 0.16 mg%	
			Na 141 mEq/l	
			K 5.4 mEq/l	
			Cl 98 mEq/l	
			Co_2 20 Mm/l	
Serologic	Zn turbidity, 2 units; latex agglutination negative.		Latex agglutination, negative.	
Bacteriologic	Mixed N-P flora. Eye—Staph. aureus, H. influenza.		N-P—alpha streptococcus micrococcus species, Candida albicans. Lung aspirate—no growth. Blood—no growth. Bone marrow—no growth. Urine—Proteus species = 100,000/cc; cytomegalic virus exam. negative (× 2). Stool—normal flora.	
Miscellaneous	Sweat Cl 42 mEq/1; Schilling test 3.7% (<3% are abnormal); D-xylose excretion 25% (normal 25-40%); stool fat, 9 gm% of dried feces (normal 10-22 gm%).		Skin test neg. PPD; Cocci.; Histo.; Blasto.	
X-ray	Chest — diffuse, bilateral pulmonary disease compatible with bronchiectasis; upper and lower GI series, normal.		Chest — severe diffuse, bilateral peribronchial infiltrate and (possible) peripheral microcysts (see Figure 1).	
Blood Typed Titer	O, no anti-A or anti-B.		A, no anti-B.	
Paper Electrophoresis	56 and 77 mg% gamma globulin, respectively.		0 mg% gamma globulin initially, then 73 mg% gamma globulin 2 days after 8 cc injected intramuscularly.	
Immunoelectrophoresis	Absent $gamma_2$; weak $Beta_2A$; weak $Beta_2M$.		Absent $gamma_2$; absent $Beta_2A$; absent $Beta_2M$.	

TIBC = total iron binding capacity. TSP = total serum proteins. N-P = nasopharyngeal. PPD = purified protein derivative.

Center in Los Angeles for treatment of an acute respiratory illness and impetigo. Two male siblings had died, one at five months and the other at six months of age. One had systemic moniliasis and the other died with vaccinia disseminata.

The patient was put in hospital and responded to local and systemic administration of antibiotic agents. Because of the family history, a serum gamma globulin assay was carried out at six weeks of age. It was 318 mg per 100 ml—normal for his age (see Chart 1). After discharge from the hospital the patient received gamma globulin, 1 to 2 ml each month. The serum gamma globulin content at three and four months was 237 and 131 mg per 100 ml, respectively.

At ten months of age the patient was readmitted in a weak, afebrile, malnourished and dyspneic condition. The anterior-posterior diameter of his chest was greater than normal, but no rales, wheezes or dullness were noted. An x-ray film showed diffuse

bilateral peribronchial infiltrate and peripheral microcysts (Figure 1). The heart rate was 170 and the rhythm regular. No murmurs were heard. The liver edge was palpated 3 cm below the right costal margin. The spleen could not be felt. The fingernails were hippocratic and cyanotic. Laboratory data are shown in Table 1. Significant findings included no anti-B isohemagglutinins, no serum gamma globulin by paper electrophoresis and absence of serum gamma$_2$, beta$_2$A and beta$_2$M globulins on immunoelectrophoresis.

The patient was placed in oxygen and was treated with fluids and antibiotics by vein, nystatin (Mycostatin®) by mouth and gamma globulin intramuscularly. He was also digitalized. His condition deteriorated and he died nine days after admission.

At autopsy, the lungs weighed 310 grams (normal for the patient's age, 110 grams). The alveoli were filled and occasionally distended with an acellular, eosinophilic reticulated material. There were occasional hyaline membranes. The alveolar septa were swollen with cellular infiltrate that was primarily histiocytic and polymorphonuclear (Figure 2). There were no plasma cells. Giemsa, Wright and Gomori stains did not reveal cysts of pneumocystitis carinii; however, periodic acid-Schiff stains revealed numerous homogenous positive dots of 1 to 3 microns in the amorphous alveolar debris. Results of virologic studies of the lung were negative.

These findings were interpreted as most consistent with pneumonia due to pneumocystis carinii.

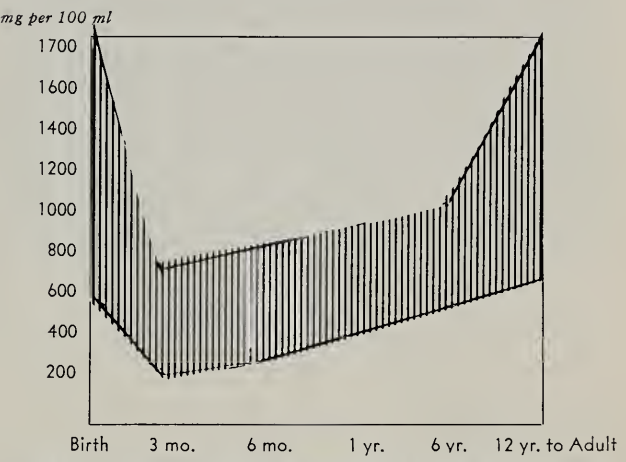


Chart 1.—Serum gamma globulin levels according to age.[22]

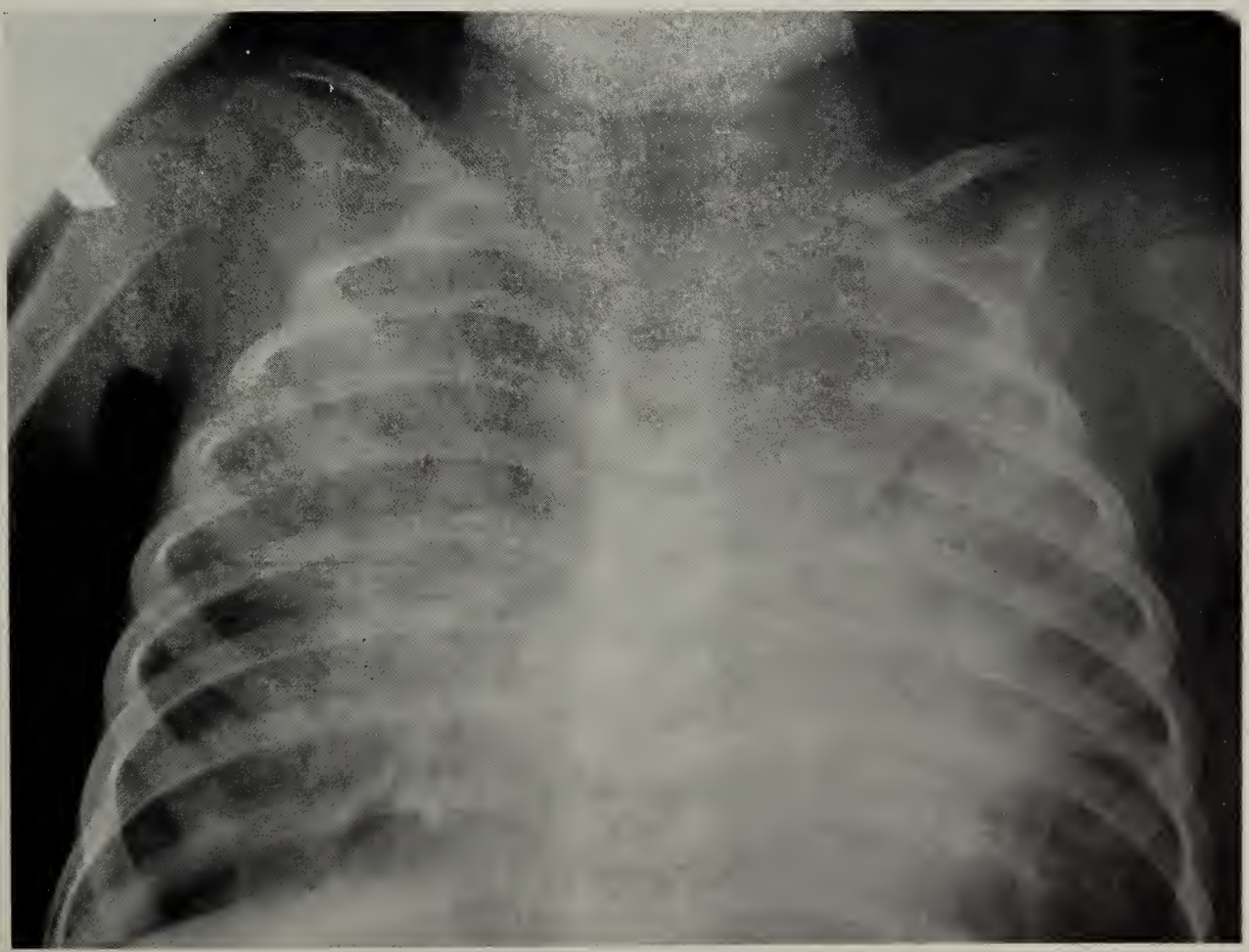


Figure 1.—Severe diffuse bilateral peribronchial infiltrate. This reproduction does not show the changes interpreted as peripheral microcysts that were seen on the original film.

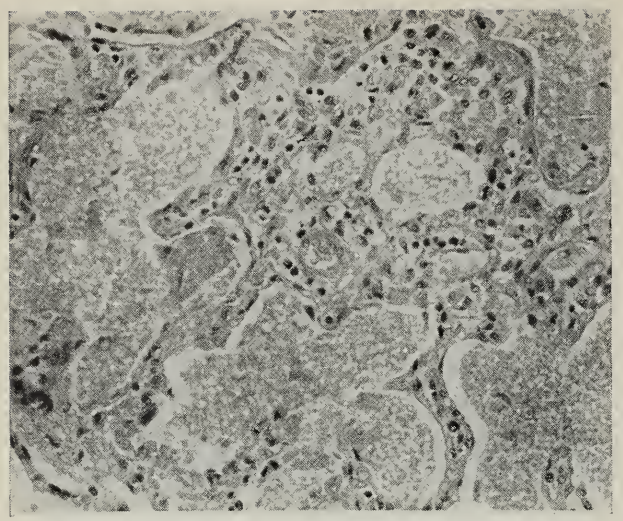


Figure 2.—(Case 2) The alveoli are filled with an acellular eosinophilic reticulated material. The alveolar septa are swollen with cellular infiltrate that is primarily histiocytic and polymorphonuclear H & E (× 325).

Discussion

The immunoglobulins represent a humoral defense against infection in children. The gamma globulin component of the immunoglobulins is the most widely known. However, recent techniques have elucidated serum proteins other than the gamma globulins which have immune properties.[21] Table 2 summarizes the nomenclature and the accepted ideas of the function of the various immunoglobulins.[6,10,20]

The confusing difference in terminology arises from synonyms applied to the same proteins simultaneously by European and American investigators.

Ultracentrifugation studies separate two immunoglobulin groups according to their molecular weight. These are labeled 7S and 19S, in accord with the Svedberg[17] unit used in ultracentrifuge analysis.

Immunoelectrophoretic analysis further separates the immunoglobulins into gamma (either $beta_2A$ or $beta_2M$) and $gamma_2$. The $gamma_2$ fraction of human serum is that portion of the immunoglobulins which is generally referred to as gamma globulin.

Immunoelectrophoresis is a technique by which serum proteins are spread horizontally by routine electrophoresis in an agar medium. Troughs are then cut into the agar at right angles to the electrophoretic separation, and specific antiserum to the various gamma globulin fractions is placed in these troughs. The antiserum then diffuses through the agar and forms precipitating arcs at the interface of the antigen-antibody reaction[15,17] (see Figure 3).

Synthesis of the immunoglobulins is thought to occur in the plasma cells of lymphoid tissue. Newborns do not begin synthesis of immunoglobulins in measurable quantities until four to twelve weeks of age.[8] Their lymphoid tissues resemble those of agamma-

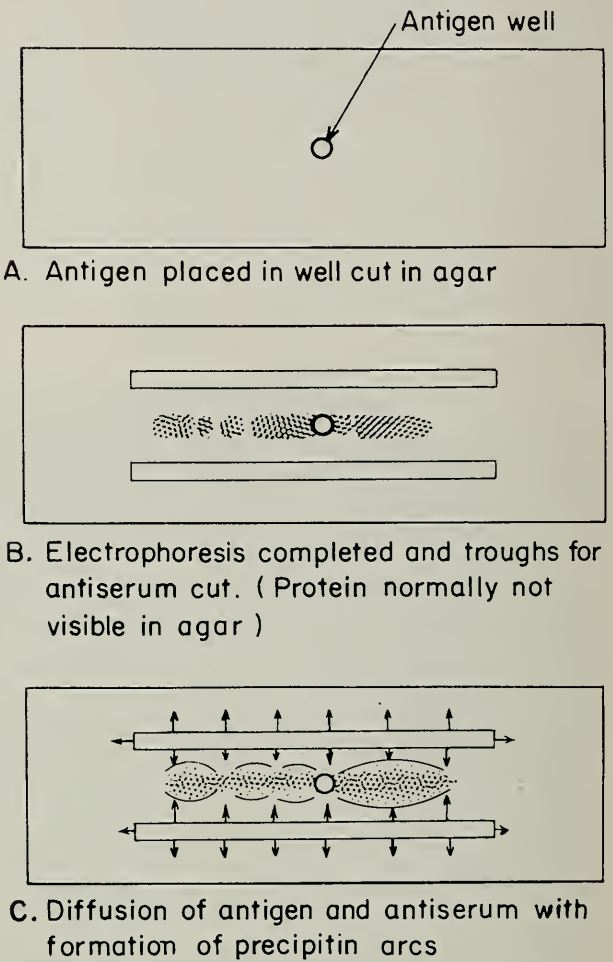


Figure 3.—Steps in the micromethod of immunoelectrophoretic analysis.[20]

TABLE 2.—*Synonyms and Functions of the Immunoglobulins*

Ultracentrifugation Analysis	*Immunoelectrophoretic Analysis*	*Function*
7S (Molecular Wgt. 150,000)	$gamma_1$ or $beta_2A$	?
	$gamma_2$ $gamma_2$	Most antibacterial and antiviral antibodies and antitoxins.
19S (Molecular Wgt. 1,000,000)	$gamma_1$ or $beta_2M$	Lupus factor, rheumatoid factor, cold agglutinin, Rh agglutinin, complete isoagglutinin (saline), reagin (Wassermann), heterophile (Forssmann), typhoid (anti-O).

TABLE 3.—*Spectrum of Immunoglobulin Deficiency States in Children*

Condition		*Age at Onset*	*Sex*	*Immunoglobulins*		
				gamma$_2$ (mg%)	*beta$_2$A*	*beta$_2$M*
Transient/Physiologic	Hypogammaglobulinemia	1 - 6 mo.	either	200-600	0	normal
Congenital/Sex-linked	Agammaglobulinemia	3 mo. - 3 yr.	male	0-200	↓	↓
Congenital/Sporadic	Agammaglobulinemia	3 mo. - 3 yr.	either	0-200	↓	↓
Acquired/Idiopathic or Infiltrated	Hypogammaglobulinemia	Child - Adult	either	variable	↓?	↓?
Congenital	Dysgammaglobulinemia (Type I)[11,12,16]	Inf. and Child.	male	200-300	↓	↑
Congenital	Dysgammaglobulinemia (Type II)[1,5]	Inf. and Child.	male	normal	↓	↓

globulinemic patients with absence of plasma cells, secondary germinal follicles and poor cortical development. The newborn receives his initial immunoglobulin protection transplacentally. Of the three immunoglobulins described, only gamma$_2$ crosses the placenta. The 19S (beta$_2$M) molecular weight of 1,000,000 is too large; it is not known why the 7S (beta$_2$A) does not cross the placenta.[11]

Antigenic stimulation enhances normal production of the immunoglobulins after the newborn period. In certain circumstances, such as in rabies therapy, excess amounts of antibody will reduce the immunoglobulin response to the antigenic stimulus.[13] Also, conditions which result in lymphoid involution, such as irradiation or antimetabolites, retard antibody production.

Normal catabolism of the immunoglobulins suggests a half-life of 20 days. This does not include conditions of excess loss such as exudative enteropathy, nephrosis or burns.

Table 3 summarizes the normal gamma globulin levels according to age.[22]

Since the original case of agammaglobulinemia described by Bruton, a spectrum of immunoglobulin deficiency states has appeared.[7] These states are summarized in Table 3, according to age, sex, and immunoelectrophoretic analysis.

A transient physiologic hypogammaglobulinemia is seen in all infants. It should be stressed that usually no replacement therapy is warranted for this physiologic condition. Bruton's original case is an example of congenital, sex-linked agammaglobulinemia, as are the two cases presented in this paper. This occurs only in males. The patient with congenital sporadic agammaglobulinemia may be either male or female and usually does not have a family history of afflicted siblings. The patient with acquired hypogammaglobulinemia may be an adult or a child. Some cases are completely idiopathic in origin, while others are due to the replacement of normal lymphoid tissue by a neoplasm, such as the case of paraproteinemia reported by Stoop and coworkers.[19] The congenital dysgammaglobulinemic patients have been studied only since the introduction of the immunoelectrophoretic techniques which have demonstrated aberrations in the beta$_2$A and beta$_2$M globulins. It should be emphasized that the patient with congenital dysgammaglobulinemia Type II may have a "normal gamma globulin" level on routine paper electrophoresis of serum proteins. Thus far, all reported cases of congenital dysgammaglobulinemia have occurred in males.

With the exception of the transient physiologic hypogammaglobulinemic infant, the patient with immunoglobulin deficiency presents a clinical profile of recurrent bacterial infections in multiple sites. The middle ear, eyelids, skin, sinuses, lungs and meninges are most often involved (see case histories). The organisms are usually pyogenic staphylococcus, streptococcus, pneumococcus, meningococcus, and hemophilus influenza. Viral infections are usually well tolerated, with the exception of fulminating cases of viral hepatitis or vaccinia disseminata. The latter had occurred in a sibling, the patient in Case 2. Parasitic infections have not been reported except for pneumocystis carinii.[3,18] Clinically, Case 2 suggested this (see x-ray film of chest—Figure 2). However, no cysts of pneumocystitis carinii were demonstrated in the lung at autopsy. Among the fungal infections, Candida albicans has been a most serious complication in these patients. Perhaps this is due to the repeated treatment with various antibiotic agents which these patients receive for their bacterial infections.

Associated clinical features of the immunoglobulin deficiency states are bronchiectasis and emphysema as a result of repeated pulmonary insults. Diarrhea, sprue and malabsorption defects have been reported. Clinically, the patient in Case 1 suggested this, but results of malabsorption studies were normal.

The incidence of rheumatoid-like joint involvement is increased in these immunoglobulin-deficient patients. Case 1 is an example. Various hematologic aberrations such as hypersplenism leukopenia and cyclic neutropenia have also been documented. The patient in Case 1 was referred with a tentative diagnosis of cyclic neutropenia, and a sibling had died with this component to his disease.

For the tentative diagnosis of the immune deficit state, a profile of screening measures is presented below. These can be performed by most clinical laboratories.

1. *Blood type and iso-agglutinin titer:* The iso-agglutinin antibody is found in the 19S-gamma fraction of the immunoglobulins. Patients with agammaglobulinemia can often be expected to demonstrate a very low titer—1:8 or less.

2. *Schick skin-testing in a previously immunized person:* The diphtheria antitoxin is found in the 7S-gamma$_2$ fraction of the immunoglobulins. A negative Schick test after recent immunization would suggest lack of antitoxin formation.

3. *Latex gamma globulin test:* This test uses the principle of the Coombs test. It is an effort to demonstrate serum antibodies against antigen-coated latex particles.[14]

4. *Serum electrophoresis (paper):* The results are interpreted according to the age of the patient, from Table 2.

After these tentative determinations are made, definitive diagnosis can be made by immunoelectrophoresis. This will demonstrate the presence or absence of all three immunoglobulins. Furthermore, if a patient is seen during an acute infectious illness, the serum is studied to determine antibody rises against the specific organisms involved. In addition, specific challenges with various antigens (for example, typhoid vaccine) may demonstrate the lack of antibody response.

It is urged that an objective diagnosis be made in all suspected cases before therapy is started. This is for the purposes of definitive care, family counseling and reduction of the financial burden of a lifetime of exogenous gamma globulin supplement.

The American Red Cross will provide a monthly allotment of the expensive gamma globulin if an objective laboratory diagnosis can be established.

The essence of treatment is replacement therapy with monthly injections of gamma globulin for all types of immune deficiency states. Commercial gamma globulin is composed of 7S-gamma and gamma$_2$. An attempt is made to maintain a serum gamma globulin level of 100 to 200 mg per 100 ml by the intramuscular injection of 100 mg per kg of body weight per month. At this time, there is no commercially available replacement for 19S gamma globulin. However, Rosen's patient with dysgammaglobulinemia Type II, who was deficient in 19S gamma globulin, improved on the above regimen.

Complications of this form of therapy are injury to the sciatic nerve from repeated large volumes injected into the gluteal region. Alleged anaphylactic reactions to human gamma globulin were recently reviewed by Glaser and coworkers.[9] Also, there has been one case of fulminant serum sickness type reactive lymphoid anaplasia and death subsequent to resumption of therapy after a treatment-free interval.[4]

Antibiotics are not given to these patients continuously, but specific infections are treated when they occur.

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REFERENCES

1. Barandum, S., Huser, H. J., and Hässig, A.: Klinische erscheinungsformen des antikörpermangel syndroms, Schweiz. Med. Wehnscher., 88:78, 1958.

2. Bruton, O. C.: Agammaglobulinemia, Pediatrics, 9:722, 1952.

3. Burke, B. A., and Krovetz, L. J.: Occurrence of pneumocystis carinii pneumonia in children with agammaglobulinemia, Pediatrics, 28:196, 1961.

4. Clinical-Pathological Conference: Rademacher's disease—diminished immunity of an unusual form complicated by lymphadenopathy, Amer. J. Med., 32:80, 1962.

5. Giedion, A., and Scheidegger, J. J.: Kongenitale immunoparese bei fehlen speyifischer B-globuline und quantitative normalen gamma globulin, Helv. Paediat. Acta, 12:241, 1957.

6. Gitlin, D., Gross, P. A., and Janeway, C. A.: The gamma globulins and their clinical significance, New Eng. J. Med., 260:21, 1959.

7. Gitlin, D., and Rosen, F. S.: Undue susceptibility to infections, Ped. Clin. N. Amer., 9:405, 1962.

8. Gitlin, D., Rosen, F. S., and Michael, J. G.: Transient 19S-gamma$_1$ globulin deficiency in the newborn infant and its significance, Pediatrics, 31:197, 1963.

9. Glaser, J., and Wyss-Souffront, W.: Alleged anaphylactic reactions to human gamma globulin, Pediatrics, 28:367, 1961.

10. Good, R. A., Kelly, W. D., Rothstein, J., and Varco, R. L.: Immunoglobulin deficiency diseases, Prog. Allergy, 6:187, 1962.

11. Hong, R., Schubert, W., Perrin, E. V., and West, C. D.: Antibody deficiency syndrome associated with beta$_2$ macroglobulinemia, J. Pediat., 61:831, 1962.

12. Huntley, C. C., Lafferty, J. W., and Lyerly, A.: Antibody deficiency associated with increased G, M globulin, Pediatrics, 32:407, 1963.

13. Krugman, S., and Ward, R.: Infectious Diseases in Childhood, 2d Edition, p. 214. C. V. Mosby Co., St., Louis, 1960.

14. Latex G-G Kit, Hyland Laboratories, Los Angeles California.

15. Ouchterlony, O.: Diffusion-in-gel methods for immunological analysis, Prog. Allergy, 5:30, 1961.

16. Rosen, F. S., Sherwin, V. K., Ezio, M., Janeway, C. A., and Gitlin, D.: Recurrent bacterial infections and dysgammaglobulinemia, Pediatrics, 28:182, 1961.

17. Scheidegger, J. J.: Une micro-méthode de l'immunoélectrophorèse, Internat. Arch. Allergy, 7:103, 1955.

18. Sheldon, W. H.: Pulmonary pneumocystis carinii infection, J. Pediat., 61:780, 1962.

19. Stoop, J. W., and Ballieux, R. E.: Paraproteinemia with secondary immune globulin deficiency in an infant, Pediatrics, 29:97, 1962.

20. West, C. D., and Hong, R.: The glycoproteins of serum, J. Pediat., 60:430, 1962.

21. Williams, C. A., and Grabar, P.: Immunoelectrophoretic studies on serum protein, J. Immunol., 74:158, 1955.

22. Zak, S. J., and Good, R. A.: Immunochemical studies on human serum gamma globulins, J. Clin. Invest., 38:579, 1959.

Clinical Usefulness of Electronystagmography

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■ *An electrical method for measuring and recording eye motion (electronystagmography) allows greater accuracy and sensitivity than methods previously used. As herein applied to studies of labyrinthine function, measurement of eye speed during caloric-induced nystagmus, as an indicator of pathological spontaneous or positional nystagmus not otherwise observable, or observation of eye motion with the lids closed, demonstrates that the technique is valuable as a clinical tool.*

DIZZINESS OR OTHER ILLUSION of spatial disorientation is one of the most common and perplexing symptoms in medicine—the reason for the symptom often remaining obscure even after the most thorough examination. One reason for this is the lack of convenient, precise, objective tests that would give etiologic clues. It is well known, for example, that lesions of the central nervous system manifest spatial disorientation, but such lesions are ordinarily rather large before the first objective signs appear. This same lack of diagnostic tests for small defects also applies to evaluation of the vestibular labyrinth. Ice-water stimulation of the ear, for example, might justifiably be compared to the testing of the sensation of touch by using a sledge hammer.

Otologists see both end organ and central nervous system types of dizziness often, the patient usually being referred in an attempt to determine whether or not the cause is labyrinthine disease—and also, usually, as part of the patient's gamut from internist to ophthalmologist to neurologist to psychiatrist. In such patients with minimal symptoms we have had, in general, no strong confidence in attributing the dizziness to disorder in the labyrinth, or of finding a cause elsewhere. Recently in a considerable proportion of cases this level of confidence has been increased considerably by the availability of new techniques for precisely measuring one objective sign of spatial disorientation—spontaneous and induced eye motion (nystagmus). This report briefly reviews that technique, called *electronystagmography* (abbreviated as ENG), and points out some of its advantages and clinical applications.

ENG takes advantage of a naturally occurring electrical potential in the eye. Electrodes placed near the outer canthi will pick up any eye movement as a change in voltage (Figure 1). This change can be recorded by a good quality electrocardiogram ma-

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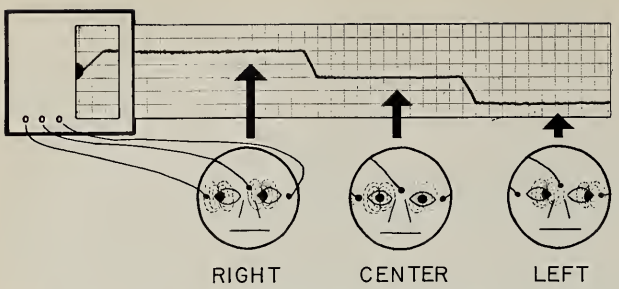


Figure 1.—Diagram of ENG technique. Electrodes near the outer canthi are within the eye's electromagnetic field. As the eyes move the electric field intensity at the electrodes is altered. This change is amplified and recorded. Ground reference electrode is at glabella. Eye motion to the right is recorded as an upward deviation of the pen; motion to the left causes a downward deflection.

chine (slightly modified) or by any sensitive recorder with suitable low frequency response. As illustrated in Figure 1, the electrodes and recorder can be arranged so that motion of the eyes to the right causes an upward deflection of the pen; motion to the left brings about a downward deflection. Up-down motions of the eyes (not shown) can be measured similarly by electrodes placed in the vertical plane. Calibration (in degrees of eye movement) is easily obtained by asking the subject to fixate alternately at two marks on the examination room wall which are separated by a known distance.

The exquisite sensitivity of this relatively easy method for measuring eye motion is demonstrated in Figure 2. This ENG tracing was obtained while a subject read aloud the following paragraph:

IT WILL BE NOTED BY THE READER THAT ALL OF THE WORDS IN
THE FIRST PART OF THIS LITTLE EXAMPLE ARE VERY EASY TO READ.
HOWEVER, THE NOMENCLATURE SUBSEQUENTLY EMPLOYED TO DESCRIBE THE
TECHNIQUE OF DIRECT CURRENT AMPLIFICATION FOR USE WITH
THE ELECTRONYSTAGMOGRAM IS SOMEWHAT MORE DIFFICULT.

This same paragraph, as spoken by the subject, is arranged immediately below the ENG tracing. Movements of the eyes to the left are recorded downward; those to the right, upward. The large downward deflections in the tracing correspond to the reader's right-to-left eye sweep as each new line is begun. The location of these sweeps (with reference to the text) suggests that the reader was scanning about one second ahead of his speech. This rapid change in eye position from the end of one line to the beginning of the next is about 15 degrees in azimuth.

The gradually rising pen deflections in the figure are associated with the slower scan of the line itself. Note that the ENG is sensitive enough to detect the difference in scanning rate between a simple group of words and a more complex set. Observe, for instance, the 1.9 seconds required to read line 1 (average speed 7.9° per second) as opposed to the more difficult line 3 wherein 4.2 seconds was needed (average speed 3.6° per second). Even smaller eye motions can be measured. The word, *electronystagmogram* was purposely obscured to demonstrate this sensitivity (see above). In an effort to decipher these

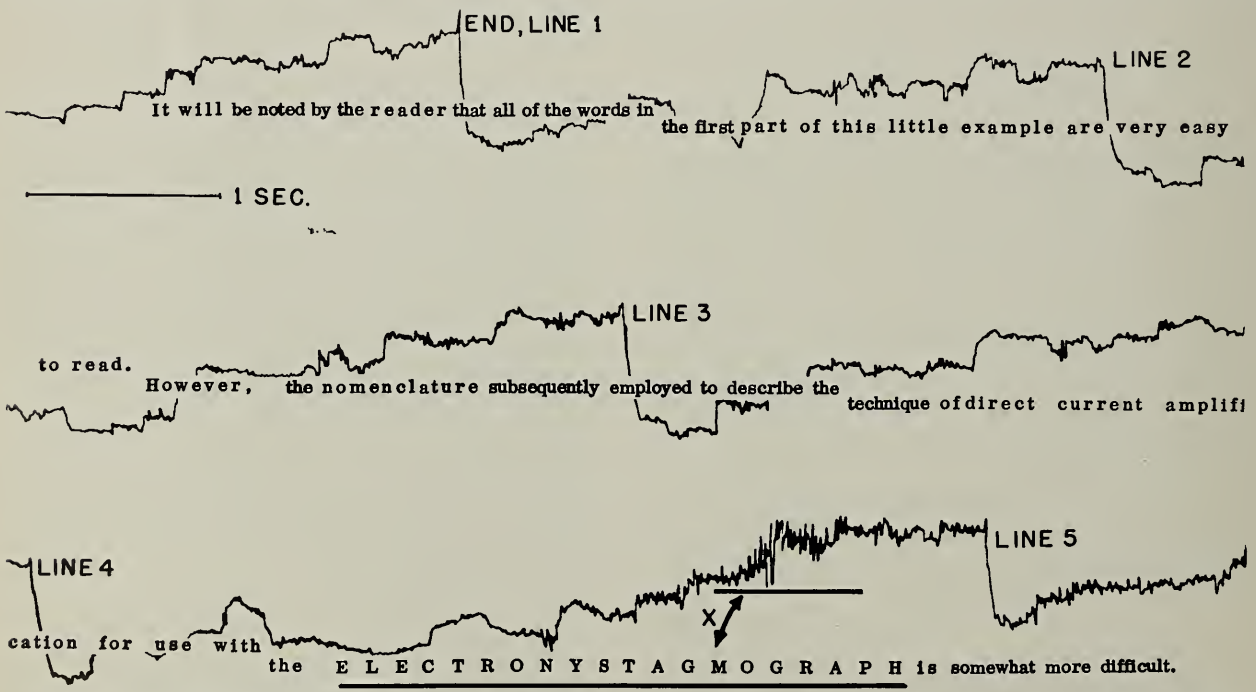


Figure 2.—Eye motion during reading. ENG tracing recorded as subject read paragraph in text. The relation between eye motion and spoken word is as indicated. Upward pen deflection indicates eye motion to the right; downward to the left.

unclear letters the reader paused, and then made a series of small left-right eye movements which are recorded in the ENG at area "X."

Clinical Applications

Evaluation of labyrinthine function. This clinical application of the ENG makes use of the above demonstrated ability to measure the speed or rate of eye motion during caloric stimulation of the ear. The eye speed during the slow phase of an induced nystagmus is the most reliable correlate of labyrinthine sensitivity.[1] Heretofore, since a speed measurement by direct observation was impossible, clinicians have been forced to rely upon secondary cues such as the duration of nystagmus after stimulation— a method which in many instances is not satisfactory.

The following clinical example illustrates one kind of situation in which the additional sensitivity of an eye speed measurement can be valuable:

A 46-year-old man was admitted to the neurological service shortly after what was described as a "seizure-like episode." As reported by the patient, he was walking toward his car when he was suddenly "thrown into the ground," became transiently disoriented, nauseated and unable to stand. A few minutes later he was able to walk with help and was completely lucid on admission.

Pertinent historical facts were limited to occasional headaches, a 15-year stable hearing loss on the left, and a few transient dizzy spells during the previous five years. Results of subsequent neurological examinations did not establish a central nervous system cause for the episode. Examination of the labyrinth by caloric stimulation was equally inconclusive and the patient was eventually referred for further examinations.

A portion of the results of the repeat vestibular examination, using the ENG and the Hallpike method for caloric stimulation, are shown in Figure 3.[2] In Figure 3, note that the duration of the nystagmus is within normal limits, and is about equal in both ears, thus confirming the earlier equivocal findings of the neurologist. In contrast, if labyrinthine sensitivity is judged by the more reliable eye speed of the nystagmus, rather than its duration, a defect in the left ear is clearly evident.

Detection of spontaneous or position-sensitive nystagmus. In most instances, the ENG's ability to define fine degrees of spontaneous nystagmus is not appreciably better than an experienced clinician's (about 1° of arc is about the finest visually detectable eye motion). There is, however, one distinct advantage of the ENG—measurement of nystagmus when the eyes are closed. With the eyes shut, the magnitude of all non-visually-induced types of nystagmus is decidedly increased.[1] A barely discernible, borderline or even a latent but pathological nystagmus can frequently be detected with great ease when the inhibitions of light and fixation are removed. Thus clinically important nystagmus may be missed when the eyes are open, yet be quite obvious when the eyes are closed. The two ENG tracings of Figure 4 are an example. The measurements were obtained from a patient whose dizzy spells were self induced by drug intoxication. When the patient's eyes were open (left), no nystagmus was noticed. When recordings were made with eyes closed (right), a distinct right-beating pathological positional nystagmus was present.

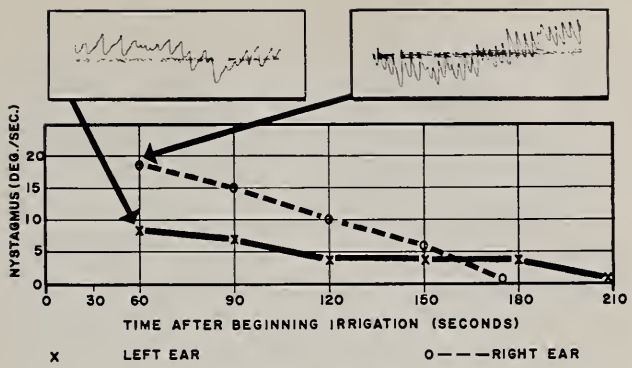


Figure 3.—Eye speed and duration of caloric induced nystagmus. Segments of ENG recordings at 60 seconds post-stimulation are shown above the graph.

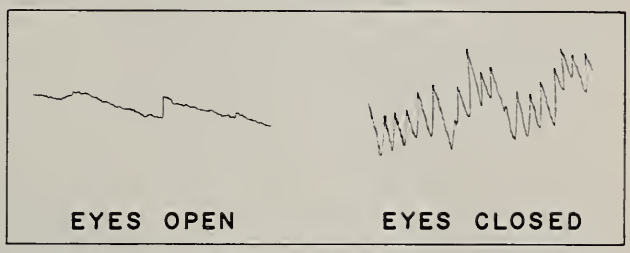


Figure 4.—Tracings of drug-induced positional nystagmus with eyes open and eyes closed.

The tracings of Figure 4 also serve to demonstrate an effect of drugs on the body's spatial orientating mechanisms—a fact already well known subjectively in the case of alcohol. It is not as commonly known, however, that these effects frequently outlast their associated subjective sensations, often to a degree which interferes with clinical testing. Small amounts of barbiturates or tranquilizers, or several cocktails on the evening before a vestibular examination, are sufficient to render a sensitive (accurate) examination impossible.[1] Indeed, we have on two instances discovered probable barbiturate addicts who had ENG measurements because of ill-defined complaints of dizziness. Conversely, chlorpromazine and antihistamines tend to suppress signs of spatial disorientation such as nystagmus. In fact, the ENG has proven to be a useful clinical and research tool in evaluating the effectiveness of many "anti-dizziness" medications.[3]

The above examples represent several of the most useful applications for the ENG in terms of their common clinical occurrence. They do not, however, exhaust pertinent applications, nor do they fully convey the flavor of modern concepts of vestibular and spatial orientating mechanisms which have to a very great degree undergone a clinical rebirth in the past few years. This renewed interest is due in great part to the massive impetus for the study of normal man since the jet and space ages have lucidly demonstrated that spatial illusions are not strictly pathological problems. We have tried to present only the most brief case for the increased use of the ENG technique by those interested in disease of the vestibular and central nervous systems. The techniques are simple. In medium-sized clinics, the cost of equipment is minimal and useful beyond question.

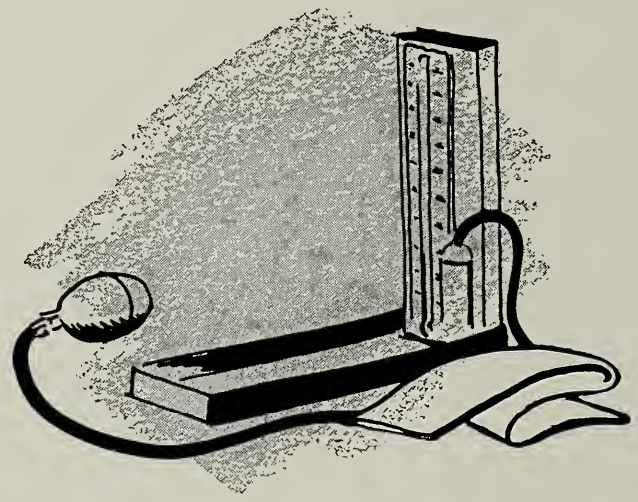
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REFERENCES

1. Aschan, G., Berstedt, M., and Stahle, J.: Nystagmography, Acta Oto-laryngol., Suppl., 129, 1956.

2. Fitzgerald, G., and Hallpike, C. S.: Studies on human vestibular function, Brain, 65-115, 1942.

3. Jongkees, L. B. W.: Influence of some drugs upon function of labyrinth, Acta Oto-laryngol., 53:281-6, 1961.



Treatment of the Mentally Retarded

The Role of the Local Physician

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Misconceptions and failure to keep abreast of current knowledge handicap the family physician in treating mentally retarded persons. Also, physicians in general apparently would rather treat acute than chronic conditions.

Multiple causes of mental retardation indicate the condition is a symptom, not a disease entity. Every patient can be helped in some degree. The treatment must always be carried out under medical supervision, whether educational, habilitational, psychological or purely the giving of medicine.

Particularly should the physician be concerned with prenatal care, metabolic disorders, increasing numbers of the "battered child syndrome," genetic counseling, psychotherapy and counseling for parent as well as child. The physician must be aware of the gaps in comprehensive services to the retardate and assist in the closing of them.

FOR MANY YEARS we have read and heard the refrain, "The mentally retarded can be helped." Yet I believe too many physicians do not believe it.

Explanation for this phenomenon is varied and speculative but some of the reasons should be advanced. Perhaps the greatest single reason for *not* accepting that the retardate can be helped is lack of knowledge, especially of knowledge that has developed over the last ten years.

Other reasons include our medical training which drilled into us, that once brain cells are destroyed, they are never replaced. Some of us recall that other cells can take over functions of the damaged or destroyed cells. But retraining is terribly slow, and most physicians like to see quick results. Often, therefore, an impatience is felt with the chronic case.

Lastly, I think that most physicians who received, not training, but exposure to the field of mental retardation developed opinions of "hopelessness" and "incurability" and "institutionalization for care and custody" from visiting a state residential facility ten or more years ago. At that time money granted by the taxpayers to run those facilities was at a bare subsistence level.

Have we made big strides in the field of dealing with mental retardation in the past ten years? *Can* the retardate really be treated? Isn't this something for the professional educator rather than a physician?

Mental retardation is a symptom of an underlying disease. It is manifested by below-average general intellectual functioning originating during the developmental period and associated with deficient maturation, learning ability or social adjustment. The diseases which may result in mental deficiency may be grouped under the following headings: Infections, intoxications, traumas, metabolic growth and nutritional disorders, new growths, unknown prenatal influences including genetic causes, known brain disorders of unknown cause and functional disorders of known and unknown cause.

We who specialize in this field do not claim that every person who is retarded will be able to assume an independent existence or will make a remarkable recovery. But we do state that every mentally retarded person *can* be helped in *some* fashion.

Delivered as part of the symposium, for members of the Santa Clara County Medical Society, on "Treatable Aspects of Mental Retardation," December 5, 1963.

Submitted December 16, 1963.

The help may not always be primarily medical—but it should always be carried out under medical supervision or direction regardless of whether the basic plan is educational, habilitational or psychological.

As we physicians are clearly aware, there exist all gradations of retardation, among all ages from infancy to senility, resulting from dozens and dozens of diseases.

It is not likely that the physician in the community will play as large a role in the treatment of the mildly or moderately retarded who is free of emotional or physical symptoms, as will the special education teacher. It is not likely that the family physician would play so large a role in the well-adjusted adult retardate enrolled in a sheltered workshop or vocational training situation, as would the rehabilitation therapist or social worker. And it is not likely that he would play a great role in dealing with the retardate with a minor emotional problem that might well be referred to the clinical psychologist.

What are some of the conditions which do require primary medical consideration or treatment? Dr. John D. Thompson, chairman of the Department of Obstetrics and Gynecology of the School of Medicine at Emory University in Georgia, wrote:

". . . the most forgotten, neglected individual in our society today is the fetus. Nobody loves a fetus; nobody feels compassion for a fetus—except the expectant mother who feels a soft flutter of movement beneath her ribs, and possibly the obstetrician whose hands probe for the outline of a small body cushioned within its mother. Our love usually begins at birth when we first see the newborn child. The fetuses—well, they just grow . . . Only sometimes they don't do this very well. Sometimes the heart is in the wrong place; or the feet grow crooked and bent; or the brain never gets quite finished. We don't see the fetus suffer and struggle against intrauterine anoxia or infection or Rh incompatibility or prolonged labor. We only see the crippled or the retarded child after birth and feel love and compassion and sorrow for the child, which we should. But we also should have these feelings for the fetus." For if we did, perhaps with our present-day knowledge we could prevent that sorrow.

We talk about building space vehicles to visit the moon. We talk about the miniaturization of components necessary for such a feat. But man, who develops from a tiny egg controlled by a complex biochemical assortment of amino acids which build the chromosomes has achieved a miniaturization that is almost unbelievable. There are an estimated 1 billion, 700 million chemical "words" laid down in the nucleus of the egg cell that gave the code or direction to develop each of us. These 1,700,000,000 words could be spread on one two-hundredth of the head of an ordinary pin in a layer only one ten-millionth of an inch thick.

Molecular biology has taught us how information is copied and translated into the thousands of kinds of protein molecules contained in each of us and how mutations may occasionally occur. We still must learn how the central nervous system stores information, reassociates it, and gives it forth again spontaneously or upon command.

There are some conditions in which our knowledge is extensive. We do know in some areas about molecular specifications that say how the brain will develop. Phenylketonuria and a few other metabolic disorders are examples. We know about specific chromosomal abnormalities such as mongolism, now preferably called Downs' syndrome.

We are much more aware of environmental factors that may interfere with normal brain development such as German measles in the pregnant mother during the first trimester; or the use of drugs such as thalidomide which leads to phocomelia, cavernous angioma and duodenal stenosis in the offspring; or the potential over-use of x-ray radiation to "see the developing fetus"; or syphilis and toxoplasmosis in the gravid mother; and psychological damage as a result of social, educational and cultural limitations among many of our people.

Let us consider other injuries which may result in brain damage and retardation and in which the physician plays a preventive or treatment role—the poisons or intoxications which may involve the fetus even before birth such as the Rh incompatibility which may lead to a bilirubin encephalopathy with deposits in the basal ganglia which bring about the conditions of kernicterus and erythroblastosis fetalis; reactions to immunizing agents such as tetanus and other toxoids; lead intoxication from chewing on painted toys; maternal dystocias, toxemias of pregnancy, prematurity, mechanical injuries at birth, cerebral anoxia as a result of delays in birth or perhaps related to anesthetic agents; post-natal brain traumas, and others.

A special word should be said about a potentially preventable condition most recently labeled "the syndrome of the battered child." You would be surprised, or perhaps not, at the frequency in retarded children, of old skull fractures and of healed fractures of long bones. Etiology unknown! Perhaps the parents relate that Johnny slipped off the bed onto the floor (which, by the way, often has a soft rug)—hardly a plausible explanation of multiple fractures. A year or so ago one pediatrician in a San Joaquin Valley town was reported to have said that at one hospital serving a community of about a hundred thousand population, 25 cases of "battered child syndrome" had been dealt with in five months.

The fascinating metabolic disorders are perhaps more widely cited as causes of mental retardation. That less than 3 per cent of cases at the Porterville State Hospital fall into this category may not be widely known. These include phenylketonuria, galactosemia, cerebral lipoidosis (Tay-Sach's disease) and the increasing number of related disorders of fat, protein and carbohydrate metabolism.

Other, fortunately rare, conditions leading to retardation include the neoplastic conditions such as tuberous sclerosis, cerebral angiomatosis and neurofibromatosis. Let us not forget the metabolic disorders of gargoylism (lipochondrodystrophy), hypothyroidism (cretinism) and arachnodactyly.

Coming to be one of the commonest conditions associated with mental retardation is Downs' syndrome, or mongolism. Some 15 per cent of cases at Porterville are so diagnosed. Today, with the advances in the study of cell structures including the chromosome itself, karyograms have revealed dozens of variations in the location, dislocation and translocation of these chains of amino acids. In mongolism we have discovered two types—the common trisomy 21, which is a non-dysjunction process leading to an extra or 47th chromosome, and the less common (estimated 5 per cent) translocation type of number 21 to numbers 13 through 16, resulting in 46 chromosomes but not the normal 46. Mongolism of this latter type is believed to be hereditary. The former has given no evidence of hereditary characteristics. Do you begin to see the implication for the physician through genetic counseling in this condition and others of like nature?

The leukodystrophies are receiving intense study. When we learn the cause of diffuse sclerosis of the brain, whether labeled Krabbe's, Pelizaeus-Merzbacher, Greenfield's, Scholz's, or Schilder's—then, perhaps, can we prevent.

Some 30 per cent of our cases are believed to be functionally (presumed psychologically) determined. These include cultural-familial retardation, environmental deprivation, emotional disturbance and psychosis or autism. As great a proportion remains in the unknown category, with neurological and/or growth pathologic states readily seen but etiologically elusive.

Perhaps we have the answers to our question: "What is the role of the local physician in the treatment of the mentally retarded? As it was so beautifully worded in the report of the task force on prevention, clinical services and residential care issued by former President Kennedy's Panel on Mental Retardation, "The medical approach to the retarded . . . should not differ in principle from the medical approach to the normal . . ."

Specifically, the local physician serves as a bridge between the family and the retardate and the many consultants and clinics required for proper assessment of the capacities of the person. He must be responsible for the whole person. He must participate in the planning for the child and at times aid in the execution of the plans. He must not deny his responsibility for counseling parents or surrender it to psychologists, social workers, educators or nurses, even though such specialists are of great value in assisting the family and the doctor.

The physician may be able to see to it that decided improvement is brought about in the environment in which children of a family are reared. He has a special role in genetic counseling. For example, in the case of mongolism, simply informing parents of the non-hereditary nature of the anomaly (if it is of the trisomic type) is certainly insufficient when the emotional problem caused by misconceptions are ignored. The family history must be discussed in detail and laboratory studies, especially karyograms, of all members of the family should be made. Such tangible evidence permits realistic education and comprehension.

Improved obstetrical care, with most careful record-keeping, may not only result in prevention of retardation but lead to future knowledge. Judicious use of hormones and immunizing agents is emphasized. Rh factor and serum bilirubin levels, phenylalanine levels and toxoplasmosis serologic studies should be performed as well as tests for syphilis and tuberculosis in pregnant women. Examination of buccal smears for chromatin bodies should be done routinely after delivery. Exchange blood transfusions may be given to the erythroblastotic child. Exposure of female children to German measles before they reach child-bearing age should be considered. The use of x-ray during pregnancy should be eliminated unless a most vital need is demonstrated. Determination well before birth of maternal dystocias (and use of cesarean section in appropriate cases) is important. Proper care of premature infants in a modern hospital having proper incubators is another step in prevention.

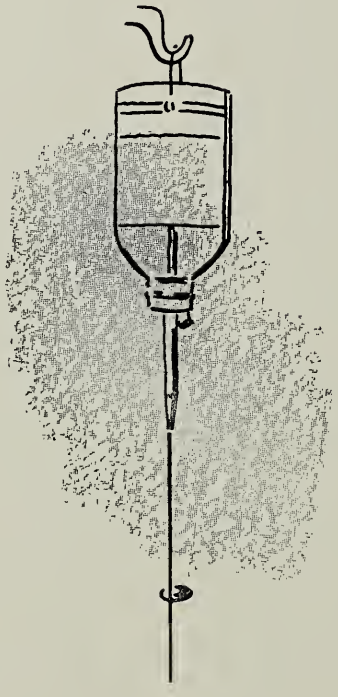
Physicians can help by giving thought and sustenance to such things as improved reporting procedures, with perhaps more involvement of the law enforcement agencies in the case of the suspected "battered child"; corrective operations for hydrocephalic children, for those with cardiac abnormality and for the orthopedically handicapped; attention to special handicaps of sight and hearing; and insistence upon dental care, which in the case of retarded persons frequently requires hospitalization and general anesthesia. I believe you would be surprised to learn how valuable the new electric toothbrush—how helpful is massage of the gums to prevent gingival hyperplasia in epileptic patients taking diphenylhydantoin (Dilantin®).

The local physician must be a psychotherapist—aware that perhaps most of the emotional problems in the retarded child are the reflection of treatable problems in the parents. Treatment of parents may, in turn, modify the symptoms in the child.

Menninger pointed out that one of the great tragedies is the lack of the specialist physicians to begin to do the job of meeting the needs of the retarded and mentally ill. We have roughly ten or eleven thousand physicians in psychiatry—not all of them psychiatrists. The family physician must take part in meeting the psyschological needs of the retardate and his family.

Pertinent is the following excerpt from the Task Force (Panel on Mental Retardation) report on Prevention, Clinical Services, and Residential Care: The physician "(1) . . . should know and keep up with the rapidly expanding specific methods and opportunities for preventing or ameliorating mental retardation. (2) In his practice or clinical and hospital responsibilities he should see to it that his knowledge is meticulously applied to all mothers, infants and children who come under his medical supervision—directly or indirectly. In this connection he should realize that he can't do the whole job alone and will need to call on a number of experts in related fields. (3) In his role as a health educator and as a leader in community health and medical services, he should be completely familiar with community facilities and services available for the overall management of his patients as well as others. He should also be aware of the gaps in services and should actively support the development and extension of the missing links."

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Fibrinolytic Therapy of Thrombophlebitis

Twenty-five Cases Studied with Serial Venograms

SYDNEY P. HECKER, M.D., *Palo Alto*

■ *Twenty-five patients with deep thrombophlebitis, whose symptoms were of less than five days' duration, had serial venograms made before and after combined streptokinase-plasmin-anticoagulant therapy. Of 20 patients presenting with evidence of inflammation, 18 were asymptomatic within five days. Evidence provided by venograms suggests that thrombolysis of varying degree occurred in eight of 23 patients with comparable pre-treatment and post-treatment venograms. In only two patients was flow restored through a major venous channel. Thus, in most cases, no evidence was adduced that the administration of Thrombolysin® (derived from the euglobulin fraction of human plasma, activated with streptokinase and containing both preformed plasmin and plasminogen activator activity) added significantly to heparin therapy.*

With the dosage schedule of streptokinase-plasmin and anticoagulants employed, pulmonary embolism occurred in two cases and hemorrhagic phenomena in three patients, exclusive of oozing from the sites of injection. Side effects were minimal.

Although thrombolysis did not occur in most cases studied, there is currently no adequate way to predict success or failure in the individual patient. One may hope for better results when the optimal choice of thrombolytic agent, dosage schedule, method of administration and anticoagulant programs are established.

THE RECENT DEVELOPMENT of thrombolytic agents such as fibrinolysin* and streptokinase,[5,20,30,31] has added a new approach to the already complex therapy of thromboembolic diseases.

These substances both have effective fibrinolytic and thrombolytic activity *in vitro* and in laboratory animals. Mixtures of activator and fibrinolysin have become commercially available for the treatment of thrombophlebitis and pulmonary embolism. Their mode of action is not well understood.

Peripheral venous thrombosis is the major condition for which fibrinolytic therapy is recommended, but critical evaluation of its efficacy is still required. The danger of the assumption that clinical improvement such as decrease in pain or edema is due to

*Reference Nos. 2, 5, 6, 10, 12, 23, 27, 32.

From the Palo Alto Medical Research Foundation, the Palo Alto Medical Clinic and Stanford University Medical School, Palo Alto.

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the reopening of the venous channel has been demonstrated by Ambrus and Sokal.[2] Subsidence of inflammatory response does not necessarily indicate increased patency, and a decrease in edema may represent reduced inflammation, increased collateral circulation or merely the effects of elevation and wrapping rather than decreased obstruction. The efficacy of thrombolytic agents in clinical thrombophlebitis is, therefore, difficult to assess without definite knowledge of the presence of a clot before therapy and demonstration of its absence after therapy. There is a paucity of information of this kind.

To study this problem we have undertaken to perform serial venograms in a group of patients with peripheral venous thrombosis before and after therapy with a commercially available fibrinolytic mixture.

Plasmin (fibrinolysin) is a proteolytic enzyme with a pronounced tendency to destroy fibrin but it will also lyse fibrinogen, casein and gelatin. It does not attack albumin, but it can destroy some of the clotting proteins such as factor V or factor VII if used in large doses or over prolonged periods.[21]

Several investigators have indicated that the effective thrombolytic principle in streptokinase-plasmin mixtures was the streptokinase itself, and that the best way to induce and sustain a thrombolytic state was by the infusion of a plasminogen activator.[18,20,28,33] The selection of the proper dose of the activator streptokinase requires an assay of the patient's plasma for circulating streptokinase antibody, which must be overcome before any excess of circulating activator can be available to induce fibrinolysis. Sherry stated that Thrombolysin®* should be viewed as a streptokinase preparation containing small amounts of plasmin, and that "its proper use must be governed by the same considerations as streptokinase alone."[28] However, good results in the treatment of thrombophlebitis were reported when a fixed-dose regimen was employed.† This simpler method was better suited to the laboratory facilities available to us, and was employed with the knowledge that some patients would be undertreated. The dose selected has been shown by several investigators to produce a good clinical response without serious side effects.[5,10,12]

Materials and Methods

The fibrinolytic preparation used in this study was Thrombolysin® (Merck, Sharp and Dohme) derived from the euglobulin fraction of human plasma and activated with streptokinase, and containing both preformed plasmin and plasminogen activator activity. It was standardized by the manufacturer to contain 50,000 "MSD units" in each vial.

Streptokinase-plasmin was administered intravenously in courses of 50,000 to 125,000 MSD units per hour for six hours on two successive days. The usual program was 75,000 units per hour on the first day and 100,000 per hour on the second. In all but one instance, the infusion was delivered directly into the affected extremity through the polyethylene tube inserted for venography. Heparin was administered intravenously in doses of 7,500 to 10,000 units every six to eight hours beginning one hour after completion of the first streptokinase-plasmin infusion. No heparin was given during an enzyme infusion in order to avoid the possibility of hemorrhage. Warfarin sodium therapy was generally started on the day after thrombolytic treatment was completed, and heparin was discontinued when the Quick prothrombin concentration dropped to between 10 per cent and 30 per cent. Anticoagulant therapy was usually carried out for 10 to 14 days and then discontinued.

Patient Selection

All patients observed over a two-year period in whom clinical symptoms of thrombophlebitis had been present for five days or less and in whom the radiographic criteria of thrombophlebitis were present were included in this study.

No patient control group was employed because the criterion for thrombolysis was venographic improvement. Although it cannot be stated that the use of anticoagulant therapy in combination with the fibrinolytic mixture did not influence the results, the use of heparin alone in acute thrombophlebitis apparently has not produced evidence of clot lysis in serial venograms.[8] Bauer described five such instances.[8] Three patients have been examined in similar fashion by the present author. In each case, the second venogram was made after five to seven days of heparin therapy. In no case did the second study differ from its control. These few observations indicated that not only was heparin ineffective in reducing clot lysis, but also that no visible clot retraction or change in tonus of the vessel wall occurred. These observations suggest that the venographic criteria of thrombolysis *(vide infra)* can probably be relied upon, especially when they are fulfilled within 48 hours.

Venograms were performed by a modification of the technique described by De Weese and Rogoff.[15,16] In each case, four exposures were made within 90 seconds after injection. Criteria for thrombosis were: (1) Constant nonfilling of all or part of a major deep vein, associated with a filling defect or collateral circulation; (2) nonfilling of all or part of a major deep vein on two examinations; or (3) sharply

*Composition described under "Materials and Methods."
†Reference Nos. 2, 5, 6, 10, 12, 23, 27, 32.

outlined filling defects visualized on two or more films in an otherwise heavily opacified vein. Criteria of thrombolysis were: (1) Visualization of a previously nonfilled channel; (2) decrease in size of a filling defect characteristic of a thrombus. Strict adherence to these criteria reduces the chance of mistaking segmental venospasm for venous occlusion.

X-ray films of the chest were made in all but one case before venography. Follow-up venograms were made 48 hours and, occasionally, 72 hours after the start of streptokinase-plasmin therapy.

Laboratory Studies of Fibrinolytic Activity

In a number of patients an effort was made to determine whether the amount of drug being employed produced changes in the circulating blood that are often associated with an active "thrombolytic system." Euglobulin lysis time, plasma fibrinogen concentration, and antiplasmin titers were measured whenever possible on specimens drawn before treatment was started and four to six hours after the beginning of the infusion.[19,26,34]

Results

Characteristics of the Group

Twenty-five patients, 15 men and 10 women, with thrombophlebitis were studied. Their ages ranged from 16 to 77 years. The right lower extremity was involved in four cases, the left in 20 and the right upper extremity in one.

The distribution of venous involvement as demonstrated by clinical and roentgenographic criteria is outlined in Table 1. In 12 cases the iliofemoral vein was occluded, and in three of these the entire deep circulation failed to fill and presumably was filled with clot.

The associated disease states and predisposing factors in this group of patients were not remarkable (Table 2). The group was probably a fairly representative one for patients with deep thrombophlebitis.

Clinical Response to Fibrinolytic Therapy

In five instances, pain, tenderness and other signs of inflammation were absent before therapy. In these cases, painless swelling, turgidity or pulmonary embolism led to the search for thrombophlebitis. Evaluation of the acute subjective response to treatment is difficult in this group.

In ten of twenty patients with symptoms and signs of acute inflammation before therapy, these signs disappeared within 48 hours, and within five days in 18 patients. The average time required for disappearance of these signs was three days (Table 3).

Thrombolytic Effect of Streptokinase-Plasmin

The frequency with which clot lysis was demonstrated is described in Table 4. Complete lysis occurred only twice. The clots were small. One was 3 inches long and in a peroneal vein, and the other was 5 inches long in an anterior tibial vein. "Marked improvement," defined as reopening of 4 or more inches of previously occluded vein, occurred five times. "Definite improvement," designated as decrease in the size of filling defects which did not initially completely occlude the vein, occurred three times. Of the 23 cases with satisfactory serial venograms, nine demonstrated some degree of improvement by venogram. Eight of these were interpreted as demonstrating clot lysis; in the remaining case the appearance of an increased number of channels may have been due to decrease in venospasm. How-

TABLE 1.—*Veins Involved by Thrombophlebitis in 25 Cases Studied*

	Number of Cases
Iliofemoral	12
Femoral	2
Femoropopliteal	1
Deep calf	9
Axillary	1

TABLE 2.—*Associated Disease and Predisposing Factors in 25 Cases of Thrombophlebitis Studied*

	Number of Cases
Postoperative	8
None	7
Pelvic infection	2
Previous phlebitis	2
Cancer	2
Rheumatoid arthritis	1
Psoriatic arthritis	1
Congestive heart failure	1
Cellulitis of leg	1

TABLE 3.—*Duration of Symptoms and Signs of Inflammation After Start of Streptokinase-Plasmin Therapy*

Days	*Number of Patients*	*Days*	*Number of Patients*
1	5	5	2
2	5	7	1
3	4	8	1
4	2		

TABLE 4.—*Venographic Evidence of Clot Lysis*

	Number of Cases
Complete lysis	2
Marked improvement	4
Definite improvement	3
Inconclusive (due to x-ray technical difficulty)	2
No improvement	14
Total	25

ever, in most cases the reopened segment was smaller than the segment which remained occluded. Despite the fact that symptoms were of less than five days' duration in every case, in two-thirds of the patients, follow-up venograms failed to demonstrate clot lysis.

Partial lysis of thrombus occurred in six cases. In half of these the popliteal or calf veins were involved and were incompletely occluded at the outset. On two occasions, when the femoral vein was completely blocked, thrombolytic therapy restored some flow throughout the length of the vein. In these cases the clinical improvement was dramatic. Short segments of vein were reopened or incomplete occlusions diminished in size in four patients. The improved segment was always at the distal end of the vein, presumably where the enzyme was able to make some direct contact with the thrombus. In 14 of 23 patients, many of whom were treated within 24 hours of the appearance of symptoms, venograms did not demonstrate clot lysis.

Relationship Between Clinical and Venographic Improvement

Of 23 patients with acceptable venograms, a good subjective response was observed during fibrinolytic therapy in 18, a good objective response in 13, and venographic evidence of some thrombolysis in eight. In every instance in which venograms showed improvement, a rapid clinical improvement preceded it. However, in ten of eighteen patients with a good subjective response, and in five of thirteen patients with good objective evidence of clinical improvement, there was no venographic evidence of thrombolysis.

Relation of Clinical and Venographic Improvement to Evidence of Increased Thrombolytic Activity in Vitro

One or more *in vitro* measurements for evidence of an enhanced fibrinolytic system were performed on 23 patients. In 19 instances, specimens of blood obtained during or immediately after several hours of enzyme therapy showed either an increased ability to lyse a standard fibrin clot or decreased fibrinogen content compared with control pretreatment specimens. In all patients showing no *in vitro* evidence of plasmin activity, there was no improvement in the venogram.

Of 19 patients with *in vitro* evidence of enhanced fibrinolytic activity, 17 had a good subjective response, 12 had good objective evidence of clinical improvement and eight demonstrated partial or complete clot lysis. Roentgenographic improvement, with a single exception, always was preceded by subjective and objective improvement.

Although all patients with improved venograms had some *in vitro* evidence of increased lytic activity during treatment, there is no direct relationship between the roentgenographic improvement and the degree of test tube activity. These tests are not of great value in predicting the clinical outcome, since they cannot, individually, or in groups, truly reflect the fibrinolytic activity *in vivo*.

Complications of Streptokinase-Plasmin Therapy

Two of these patients had a rise in temperature of greater than 1° F during the enzyme infusion. This is a relatively low incidence of fever, since other investigators have previously reported such reactions in 30 to 50 per cent of patients.[13,22] The two in whom fever developed (102° F, 104° F) also experienced malaise and chills. One patient had malaise, nausea and vomiting.

Hemorrhage occurred three times: in one patient, in whom phlebitis had developed ten days after a hysterectomy, vaginal bleeding required transfusion and cessation of anticoagulant therapy; a large area of ecchymosis occurred in the subdeltoid region in a patient who through error received a heparin injection at this site during a plasmin infusion; spontaneous ecchymosis of the thenar space occurred in a third patient but did not require specific therapy. Oozing from cutdowns or venipunctures occurred commonly but was always easily controlled with pressure dressings.

Pulmonary Embolism

Six patients in this group had pulmonary embolism with infarction within the month preceding streptokinase-plasmin therapy. Two patients had pulmonary emboli during the streptokinase-plasmin infusion; in one of these the first embolism occurred during the infusion. In both instances the symptoms were slight and the infarcts small.

Postphlebitic Syndrome

Sixteen patients remained completely free of postphlebitic syndrome during the follow-up period of one month or two years. The veins involved are listed in Table 5. Of the eight surviving patients with postphlebitic syndrome, good venographic studies are available in seven. In every instance pre-treatment films showed lack of filling in the entire deep venous system—calf veins, popliteal and femoral vein. Post-treatment films were unchanged in four, but were classified as showing "marked improvement" in three.

In 16 patients without postphlebitic sequelae, nine showed no roentgenographic improvement after therapy. Postphlebitic changes were present in five of seven patients with complete obliteration of all the deep calf and superficial femoral veins. In six patients with obliteration of the superficial femoral vein but patent calf veins, chronic changes have not appeared. In the remaining seven patients without postphlebitic changes, the major involvement was in

the deep veins of the calf. The veins in which thrombolysis occurred were the iliofemoral in two cases, the popliteal in two and the deep calf in four.

Discussion

Theoretical Considerations

The use of a thrombolytic enzyme in combination with anticoagulants offers the theoretical advantage of removing by digestion the offending thrombus, thus decreasing the risk of pulmonary embolism in the acute phase of thrombophlebitis, and reducing the incidence of chronic venous obstruction. Unfortunately, some of the clinical and pathological features of thrombophlebitis may sharply limit the effectiveness of this theoretically ideal approach. Four major variables must be considered.

1. *The age of the thrombus* is of great importance, since plasmin is known to be relatively ineffective on thrombi more than five days old.[7] Unfortunately, a venous clot may be present for days or weeks without producing symptoms. The symptoms may result from a small addition to the preexisting thrombus, or from pulmonary embolism. Sometimes, more recently formed portions of the clot may lyse, while the older, better organized portions may resist treatment.

2. *The accessibility of the thrombus* to the enzyme is also vital. If a fibrinolytic enzyme is in contact only with the distal tip of a long clot, its effectiveness will be limited. The physical structure of the thrombus is therefore important. If it is very dense, and no trickle of blood can traverse even its largest interstices, complete lysis may be prevented. A fibrin-rich clot will be more resistant than one low in fibrin.

The anatomic characteristics of the vessels involved may affect the contact between plasmin and thrombus. The superficial femoral vein which is the major carrier of blood from the leg has very few collaterals throughout its course. Thus, enzyme-containing blood may be in contact with a superficial femoral thrombus only at its upper and lower ends.

Fibrinolytic enzymes may also be kept from the thrombus by the presence of circulating inhibitors.[1,25] This point is controversial.[3] There is evidence that the fibrin substrate in the clot is able to separate plasmin from the loose plasmin-antiplasmin complex in the circulating blood.[4] Some investigators argue, however, that activators of endogenous plasminogen would prove more effective thrombolytic tools than the end product, plasmin.[1]

3. *The proper dose of enzyme* is necessary for success. This probably varies greatly depending on the age, size, structure and position of the thrombus, as well as the presence of inhibitors. At present there is no adequate method of predicting the optimal dose of a streptokinase-plasmin mixture. The dosage regimen used in this study may have been inadequate in many instances.

4. *Anticoagulant therapy* should probably be employed in conjunction with streptokinase-plasmin if the best possible results are to be achieved.[24] Heparin is the anticoagulant of choice. It acts rapidly, its action is readily reversible and it does not further depress clotting factors which may have been lowered by the use of plasmin. It must be used with caution, however.[14,24]

TABLE 5.—*Veins Involved in 16 Patients Without Postphlebitic Syndrome*

	Number of Cases
Iliofemoral	6
Iliofemoral, popliteal and deep calf	2
Popliteal	3
Deep calf	4
Axillary	1

Previous Studies

Numerous reports are available on the clinical application of fibrinolytic enzymes to the treatment of peripheral venous thrombosis. A comparison of the results of several investigators is complicated by differences in techniques of administration, varying dosage schedules, the presence of concomitant malignant disease in many patients, and lack of conclusive evidence regarding the fate of the thrombus. Nevertheless, many investigators have concluded that fibrinolytic therapy significantly improves the clinical course of thrombophlebitis.[5,11,12,13] Controls were lacking in these studies, however, and venography was employed infrequently.

Evans and Smadel,[17] using venography in a study of 28 women with postmastectomy edema of the upper extremity, demonstrated that the veins were probably occluded in 27. Eight patients were treated with a fibrinolytic mixture and subsequent venograms showed reopening of the channel in five.

Moser and coworkers[23] described a controlled study of 62 patients. Although the group treated with streptokinase-plasmin fared significantly better than the controls, angiographic studies were not obtained and the incidence of clot lysis is unknown. The present report, however, does not support the impression of many observers that therapy with fibrinolytic drugs is definitely superior to anticoagulant therapy alone.

In the present series of 25 patients, 20 had symptoms and signs of inflammation when first observed. The average time required for complete disappearance of symptoms was three days, with a range of one to eight days (Table 3). Thus, in 18 of 20

patients, complete regression of clinical findings occurred in five days or less. Some observers have found three to eight days to be the average recumbency time in patients with thrombophlebitis treated with anticoagulants. For example, Bauer's clinical results in patients treated with heparin alone compare favorably with those of the present series in duration of disability during the acute phase and in apparent absence of pulmonary embolism. However, a comparison of "hospital days" data from different centers is not valid.[9,35] Moser's streptokinase-plasmin treated patients required an average stay of 15 hospital days, Davis' 10.5 days, and those in the present series 12 days. These discrepancies reflect the nature of the hospital involved, local custom and the personal criteria of the clinician rather than true differences in the course of the disease or the nature of the treatment.

Although clinical improvement usually occurs after anticoagulant or fibrinolytic-anticoagulant therapy is instituted, angiographic evidence of thrombolysis usually does not occur.

The prevention of pulmonary embolism, probably the most important objective of therapy, may be more successful in streptokinase-plasmin treated patients than in anticoagulant treated controls.[23] Much more experience is needed, however, for this conclusion to be firmly drawn. Pulmonary infarction occurred in two of the patients in the present series during enzyme infusion. In both, the symptoms were slight and the infarcts small. Fibrinolytic therapy does not appear to increase the risk of embolism; in fact, its use seems to decrease the size of emboli, to prevent recurrent embolism when anticoagulants have failed to do so,[12] and to hasten the resolution of pulmonary infarcts.[29]

Theoretically, restoration of the vascular lumen, especially of the large veins, should prevent the postphlebitic syndrome. In this series, some flow was reestablished throughout the length of the femoral vein on two occasions. It can be hoped that late complications will, therefore, be entirely absent or greatly diminished in severity in these two patients. In six instances in which thrombolysis occurred, the veins involved were so situated or the portions of clot lysed so small in relation to the amount of persistent occlusion, that it is doubtful that late complications have been significantly influenced. It is unfortunately precisely those thrombi which produce the greatest disability that are, because of their size and position, most difficult to dissolve.

The results of treatment in this series of patients are directly linked to the dosage regimen of streptokinase-plasmin and anticoagulants employed. Clinical studies with more accurately tailored doses of streptokinase-plasmin or with other fibrinolytic agents will clarify the potentialities and limitations of thrombolytic therapy.

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REFERENCES

1. Alkjaersig, N., Fletcher, A. P., and Sherry, S.: The mechanism of clot dissolution by plasmin, J. Clin. Invest. 38:1086-1095, July 1959.

2. Ambrus, J. L., Ambrus, C. M., Back, N., Sokal, J. E., and Collins, G. L.: Clinical and experimental studies on fibrinolytic enzymes, Ann. N. Y. Acad. Sci. 68:97, Aug. 30 1957.

3. Ambrus, C. M., Markus, G., and Benson, D. R.: Studies on the substrate affinity of plasmin, Fed. Proc. 18:362, Mar. 1959.

4. Ambrus, C. M. and Markus, G.: Plasmin-antiplasmin complex as a reservoir of fibrinolytic enzyme, Am. J. Physiol. 199:491-494, Sept. 1960.

5. Ambrus, J. L., Ambrus, C. M., Sokal, J. E., Markus, G., Back, N., Stutzman, L., Razis, D., Ross, C. A., Smith, B. H., Rekate, A. C., Collins, G. L., Kline, D. L., and Fishman, J. B.: Clinical pharmacology of various types of fibrinolytic enzyme preparations, Am. J. Cardiol. 6:462, Aug. 1960.

6. Back, N., Ambrus, J. L., Goldstein, S., and Harrisson, J. W. E.: *In vivo* fibrinolytic activity and pharmacology of various plasmin (fibrinolysin) preparations, Circulation Res. 4:440, July 1956.

7. Back, N., Ambrus, J. L., Simpson, C. L., and Shulman, S.: Study on the effect of streptokinase activated plasmin (fibrinolysin) on clots in various stages of organization, J. Clin. Invest. 37:864, June 1958.

8. Bauer, G.: A roentgenological and clinical study of the sequels of thrombosis, Acta Chir. Scand. Suppl. 74:95, 1942.

9. Bauer, G.: *In:* Proceedings of the First International Congress on Thrombosis and Embolism, 721-725, 1955.

10. Boucek, R. J., and Murphy, W. P.: Segmental perfusion of the coronary arteries in man following myocardial infarction, Am. J. Cardiol. 6:525, Aug. 1960.

11. Carroll, B. J.: Clinical observations in the treatment of phlebothrombosis with fibrinolysin, Angiology 10:308-310, Aug. 1959.

12. Cliffton, E. E.: Review of clinical experience with clot-lysing agents, Am. J. Cardiol. 6:476, Aug. 1960.

13. Davis, N. D., Carroll, B. J., and Schwartz, S. H.: Treatment of thrombophlebitis with a fibrinolytic agent. With special reference to side effects, Am. J. Cardiol. 6:513, Aug. 1960.

14. Deaton, H. L., Anlyan, W. G., Silver, D., and Webster, J.: Thrombosis: Prevention and treatment, Surgery 49:130-141, Jan. 1961.

15. De Weese, J. A., and Rogoff, S. M.: Clinical uses of functional ascending phlebography of the lower extremity, Angiology 9:268:277, Oct. 1958.

16. De Weese, J. A., and Rogoff, S. M.: Functional ascending phlebography of the lower extremity by serial long film technique, Am. J. Roentgenology 81:841-853, May 1959.

17. Evans, J., and Smadel, M.: Clinical experiences with fibrinolysin therapy, Angiology 59:311-318, Aug. 1959.

18. Fletcher, A. P., Alkjaersig, N. and Sherry, S.: The maintenance of a sustained thrombolytic state in man. Induction and effects, J. Clin. Invest. 38:1096, July 1959.

19. Fowell, A. H.: Turbidimetric method of fibrinogen assay, Am. J. Clin. Path. 25:340-341, Mar. 1955.

20. Johnson, A. J., and McCarty, W. R.: Streptokinase as a thrombolytic agent, Am. J. Cardiol. 6:487:495, Aug. 1960.

21. Koller, F.: The development of our knowledge of fibrinolysis, Am. J. Cardiol. 6:367:-370, Aug. 1960.

22. Moser, K. M.: Effects of intravenous administration of fibrinolysin (plasmin) in man, Circulation 20:42, July 1959.

23. Moser, K. M., Sulavik, S. B., and Hajjar, G. C.: Fibrinolysin (plasmin) therapy in acute deep thrombophlebitis. A controlled study, Circulation 21:337-352, Mar. 1960.

24. Moser, K. M. and Hajjar, G. C.: The combined use of fibrinolytic and anticoagulant agents. Laboratory and clinical considerations, Am. J. Cardiol. 6:496, Aug. 1960.

25. Norman, P. S. and Hill, B. M.: Studies of the plasmin system. III. Physical properties of the two plasmin inhibitors in plasma, J. Exper. Med. 108:639-649, Nov. 1958.

26. Rodenbaugh, F. H.: Observations on plasmin in human thromboembolic disease, U. Minn. Press: 17, 1957.

27. Ruegsegger, P., Nydick, I., Abarquex, R., Reichel, F., Cliffton, E. E., and La Due, J. S.: Effect of fibrinolytic (plasmin) therapy on the physiopathology of myocardial infarction, Am. J. Cardiol. 6:519, Aug. 1960.

28. Sawyer, W. D., Alkjaersig, N., Fletcher, A. P., and Sherry, S.: Thrombolytic therapy, Arch. Int. Med. 107:274-289, Feb. 1961.

29. Sheffer, A. L., and Israel, H. L.: The treatment of pulmonary embolism with fibrinolysin, Angiology 10:292, Aug. 1959.

30. Sherry, S., Fletcher, A. P., and Alkjaersig, N.: Developments in fibrinolytic therapy for thromboembolic disease, Ann. Int. Med. 50:560-570, Mar. 1959.

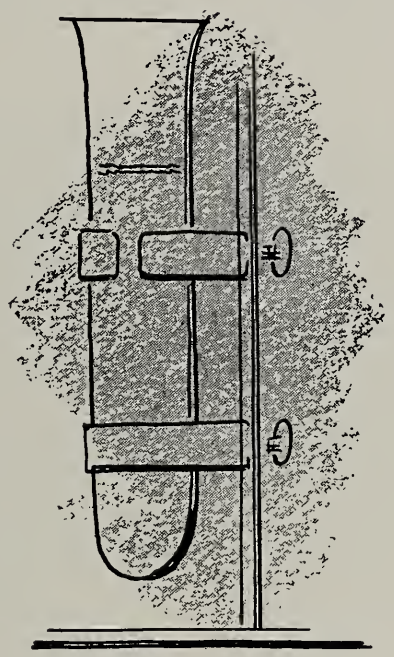
31. Sherry, S., and Alkjaersig, N.: Studies on the activation of human plasminogen (profibrinolysin), J. Clin. Invest. 35:735, June 1956.

32. Sussman, B. J., and Fitch, T. S. P.: Thrombolysis with fibrinolysin in cerebral arterial occlusion, J.A.M.A. 167:1705, Aug. 2 1958.

33. Tillett, W. S., Johnson, A. J. and McCarty, W. R.: Intravenous infusion of the streptococcal fibrinolytic principle (streptokinase) into patients, J. Clin. Invest. 34:169, Feb. 1955.

34. Von Kaulla, K., and Schultz, R. L.: Methods for the evaluation of human fibrinolysis studies with two combined techniques, Am. J. Clin. Path. 29:104, Feb. 1958.

35. Zilliacus, H.: *In:* Proceedings of the First International Congress on Thrombosis and Embolism, 721-725, 1955.



The Functioning of a Private Psychiatric Clinic

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■ *Some of the clinical advantages of a private psychiatric clinic organized for group practice are: Readily available consultations with colleagues; cross-referral with better communication; more evenly filled hours; larger pools of patients for establishing and maintaining group therapy; better off-duty coverage; ready availability of the three disciplines, psychiatry, psychology and social work; satisfaction to the private psychiatrist of being able to arrange competent and prompt treatment for patients unable to meet usual fees; and cooperative research.*

Financial advantages include economies of time and money, a profit sharing plan, and availability of group life insurance, health benefits and social security.

SOME FIVE YEARS AGO one of the authors (WGC), a psychiatrist, initiated the formation of a psychiatric group practice clinic with a clinical psychologist and a part-time social worker. The success and experience with this smaller group was one of the factors that led to the formation of the larger group we have at present. Also, about eight years ago, one of the authors (RAH) started a seminar group that met every week to discuss cases, problems, treatment, research and other such items with each other, and the value that we recognized in these meetings was another factor that led to the formation of a larger group. Another factor was the desire for some of the financial advantages available to a larger group.

At present the group consists of four psychiatrists, one clinical psychologist, one full-time psychiatric social worker, and one part-time psychiatric social worker. All the psychiatrists had been established in psychiatric practice for six to twelve years when the group was formed. The clinical psychologist is a Ph.D., certified in his field, who has more than eight years of clinical experience. Each of the social workers has an M.A. in social work and over five years' experience. Thus the group has not had to contend with inexperienced personnel and the members had full confidence in each other's professional abilities from the start.

Intake Procedure

The group functions in a city (San Jose) of almost 300,000 population situated at the south end of San Francisco Bay, approximately fifty miles from San Francisco. The area has just about completed transformation from a rural farming community to an industrial complex of both large and small businesses. It is the home of a state college and a two-year city college. Psychiatry has been only partially accepted as a community necessity. Therefore it was with some concern as to how patients and other physicians would accept this idea that the group, after a year of operation, hired its first full-time psychiatric social worker. Surprisingly there have been almost no problems in terms of public or medical acceptance of the psychiatric social workers or psychologist and we feel that perhaps our procedures have something to do with these results.

As usual the psychiatrist accepts referrals made to him and in the case of these personal referrals it is optional whether he sees the patient first or refers him to the psychiatric social worker for an interview. As most of us are rather heavily scheduled, it is often helpful to be able to give an appointment first with the psychiatric social worker, thereby avoiding a wait of several weeks on the part of the patient. Many patients appreciate this prompt attention. Thus frequently the first one or two visits are for interview with the psychiatric social worker and background material is ready for the psychiatrist when he sees the patient. In this process, emergency problems can be noted quickly and the screening psychiatrist notified, yet the psychiatrist is spared the fairly large number of missed or cancelled first appointments by patients who are not ready for therapy.

Submitted June 17, 1963.

The psychiatrist is then in a position to see whether he will carry out the treatment himself or assign the patient to the psychologist or one of the psychiatric social workers for treatment under his supervision. The responsibility for the care of the patient rests with the psychiatrist and it is his responsibility to keep the referring physician informed as to the patient's progress. The social worker has one hour a week with each of the psychiatrists so that the psychiatrist can really supervise the treatment of patients that he is not dealing with directly.

Since the group now has been in operation for three years, a growing number of patients are being referred to the group per se. In such instances the psychiatric social worker does an intake history and then the patient is seen briefly by a psychiatrist who may decide either to carry out treatment personally or supervise treatment by one of the non-physician psychotherapists. Each of the psychiatrists takes turns in handling these cases so that the burden is distributed equally.

Therapy

The treatment offered includes individual and group therapy for adults, children and families. Several of the members of our group have had extensive experience with group therapy and the others in the group have profited from their experience. Whereas in solo practice it is often difficult to form groups for group therapy simply because one psychiatrist does not have enough patients suitable for this method, in a group practice such as ours the pool of patients is much larger and groups easier to form. At our clinic it developed that a patient being treated individually by one therapist was concurrently in group therapy with another therapist. In many cases this was felt to be of benefit, as some of the patients seemed to be enmeshed in ambivalent transference relationships or were perhaps otherwise bogged down in their individual therapy. The relationship with a new therapist in the group often seemed to get things moving again and frequently to lessen the transference difficulty by a splitting of the ambivalent aspects of the transference, one of the therapists becoming the "good parent" and the other the "bad parent."

A patient in group therapy is usually also being seen at least monthly in individual therapy. As our experience grows we find that the range of patients suitable for this form of treatment has expanded and that only a minority of patients refuse to accept group therapy when it is recommended to them. Refusal is often on the grounds of their social standing in the community and fear of loss of respect and prestige.

One of the authors (WGC) believes that if a patient needs more intensive therapy the possibility of adding group therapy to the individual visits should first be considered. Often financial considerations make this the most practical or the only way of getting more intensive treatment. He feels that in the majority of cases it is likely to be the most helpful by reason of avoiding difficult transference situations and encouraging patient interaction and communication. In general our attitude is that group therapy is a treatment modality in its own right that can be offered at a lesser cost.

We have a fully equipped playroom and do therapy with children and parents. Recently we have been doing work with the family—or what is termed "conjoint family therapy." This seems to be helpful in certain cases in which the family relationships seem to force one member into pathological patterns. While it may offer a more direct and shorter approach to the core of the problem, however, it is in many ways more demanding on the therapist.

We also offer the full range of psychological testing—intelligence, projective, vocational—as well as vocational and marital counseling.

In some selected cases we have had the social workers make home visits.

Clinical Benefits

Seminars. We have continued the weekly seminar meetings begun eight years ago and they are generally well attended. In discussing cases under treatment the pooled experience is extremely helpful. These discussions delineate dynamic and technical factors as well as relieve anxieties of all of us as well as the therapist of the particular case. From these discussions one research project has already developed and been completed* and another is in progress. We hope to be able to develop a research institute connected with our group in the near future. Simple equipment such as tape recorders are already in use, and we hope to be able to receive grants for more complex equipment in the future.

Referrals. It has been helpful when treating a patient whose spouse enters therapy to refer the spouse to a colleague in the group because of easy access to consultation and communication. In one case the suicidal behavior of the husband was discussed by the wife with her therapist. Inquiry disclosed that the husband was not discussing this behavior with his therapist. Thereupon this factor was brought into treatment, resulting in hospitalization of the husband and the beginning of conjoint family therapy which brought about a decided improvement in their relationship.

We are able to keep our hours more evenly filled by referring, when indicated, to our colleagues in the group. We keep informed as to who has any time unfilled.

*An Experimental Study of the Couch. In press.

Since we tend to see each other frequently—at coffee breaks and lunch, for example—informal consultation and communication occurs more easily. We also tend to cover for each other during off-duty hours and we can more readily provide coverage during these times. The benefits of these frequent interchanges can be appreciated by one who has been in solo practice and is aware of how easy it is to become isolated.

Clerical Methods. One of the most obvious areas of efficiency in group functioning is in bookkeeping and secretarial functions. By consolidating our bookkeeping procedures through the use of our up-to-date billing system with a modern duplicating machine, it is possible for one part-time bookkeeper to handle all these functions for the group. Each patient has one charge card and the charges for visits to different therapists are all entered on this card, the patient receiving an exact duplicate of the itemized master card. The group also has its own collection services so that the doctor is relieved of handling these problems personally. This control allows the maximum collections consistent with concern for the patient's welfare.

Financial. The group generates considerable savings by centralizing secretarial and bookkeeping functions. We also have the benefits of group life insurance and a profit sharing plan.

The profit sharing plan is only possible because we function like a corporation—and are so taxed, even though we are an unincorporated medical association. This means that everyone is on a salary and all business decisions are handled by an executive committee which is chosen by the "stockholders" at an annual meeting. Each individual (clerical as well as professional) invests 15 per cent of his salary, before taxes, in the group's profit sharing plan. These funds accumulate until the money is disbursed to the individual when he retires or leaves the group, and the tax advantage available to him by this device is considerable.

The premiums for the group life insurance, which cover clerical as well as professional staff, are paid for by the group as a business expense. The amount of insurance is related to the salary of the individual and varies from $8,000 to $20,000 of term insurance. Here there are benefits of not only paying premiums before taxes but lower premiums as well due to the group rate. Also, this is especially favorable to those who have some disability which ordinarily would deny them life insurance entirely or necessitate their paying sharply higher rates. We also have health and accident and hospital insurance, and here again the premiums are paid by the group, which means a considerable tax saving. We also participate in the Social Security program, which is not available to solo practitioners—the group paying half the cost and the employee the other half. The benefit to the estate of a married physician with children is substantial, as the Social Security system would pay $82.50 per month for the wife and each child up to a maximum of $254.00 per month per family.

The group pays the cost of legal and tax consultation and accounting services as needed. This gives us the security of complying with all complex governmental regulations yet retaining our freedom of action.

Even though some of us had been in solo practice ten years or more we are very satisfied with being part of a group and being on a regular salary, with paid vacations, sick leave and profit sharing, in addition to the clinical benefits.

Role in the Community. Perhaps in the area of community service the group has a larger potential role. One of the authors directed a county-supported psychiatric clinic for a time, and believes that private psychiatrists have been too engrossed in treating patients who can afford therapy and have left the treatment of patients who cannot pay a full fee to the community agencies. Since our group is a private group which of necessity must meet its own expenses through fees, there is a limit to the reduction of fees. However, since the group hires the psychiatric social worker and the psychologist, fees need only cover their salaries and expenses; hence fees that are lower than those of the average psychiatrist can be charged. Since most of the direct treatment in the public clinics is done by psychiatric social workers and psychologists our group is able to provide a comparable service plus the benefits of private treatment, which is more rapid, personal and flexible. This also preserves the direct financial relationship of patients with the persons providing the services rather than the indirect one of government taxation and administration.

We are now seeing many patients who formerly could only receive treatment at public clinics, many of them with long waiting lists. It is our contention that we provide a more economical service than a comparable public clinic, as we function more efficiently in the use of treatment time. Our hourly cost is frequently half that of public clinics. We do not have the innumerable conferences and meetings that seem to take up a large part of staff time in clinics, perhaps because we earn only when we are treating.

This is an example of how private enterprise can function to give more efficiently a service that is usually only available through governmental or charitable agencies. We hope that this will be one direction of future growth in psychiatric medical practice.

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The Leukemias

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THE LEUKEMIAS have interested clinicians and investigators for many years as difficult and challenging clinical and biological problems. In recent years there has been immense expansion in the basic knowledge regarding leukemia; and important advances have been made in clinical management, although cure or effective control has not yet been achieved. The importance of this group of diseases is dramatized by the statistical data which indicate that approximately eleven thousand deaths from leukemia were recorded in the United States in 1955. This made up 4.5 per cent of all deaths due to malignant neoplasms and represented an increase of 2.1 per cent since 1930.[23] This presentation will comprise a brief resumé of some aspects of the pathogenesis of the leukemias, a review of the important clinical features and discussions of methods of management now in use.

The leukemias are a heterogeneous group of diseases characterized by uncontrolled disturbances in the proliferation, differentiation and maturation of the leukocytic and other hematopoietic tissues, ultimately leading to the death of the affected person. It is probable that the term "leukemia" covers many diverse clinical syndromes having different etiologic backgrounds. Experimental studies in animals and clinical data in man indicate that the development of leukemia and other neoplastic diseases is the outcome of the interaction of a number of agent, host and environmental factors.[17,28,53] The development of leukemia depends upon the interaction of such agents as mutagenic chemicals, ionizing radiations, viruses, etc., with a susceptible host. The susceptibility of a specific individual to a leukemogenic agent is conditioned by numerous known and unknown host and environmental factors. A few of the more important of these are shown in Chart 1.

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Some of the most important and exciting advances in research in cellular biochemistry have shown that the deoxyribonucleic acid (DNA) present in the chromosomes contains the genetic information or "code" in the form of the structural arrangement of its purine and pyrimidine bases. The genetic control of enzyme and protein synthesis which gives cells their phenotypic expression in morphology and function is directed by the nuclear DNA through its control of the ribonucleic acid (RNA)-rich ribosomes in the cytoplasm.[10,22] Current studies indicate that the leukemogenic action of viruses, ionizing radiations and carcinogenic hydrocarbons may occur through their influence on the function of the nucleic acids in the cells. Viruses, composed mainly of DNA or RNA, are believed to parasitize the cell and assume control of the metabolic mechanisms for their own survival and multiplication.

A virus may remain in a latent state within the cell until activated by such factors as hormonal balance or nutritional status within the host, or by such external influences as mutagenic chemicals or ionizing radiations. Viruses, radiations, chemicals and other factors, either singly or in combination, could directly damage or alter the genetic code, produce deletions of genetic material, or disturb the ribosomal synthesis of enzymes and proteins. The result of such damage might be to change the ability of the cells to respond to normal homeostatic forces by producing cellular malfunction, early death or unrestrained proliferation.[10,17,22]

That several types of mouse leukemia and cancer are caused by viruses is now accepted.[1,37] Recent studies demonstrating viral-like particles in tissues of leukemic patients, which when injected into animals will produce leukemia and other tumors, and the reports of "outbreaks" of leukemia support the hypothesis that viruses play an etiologic role in human leukemia.[26,52] It has been reported that human adenoviruses can induce tumors in hamsters and that increased titers of ade-

THE NATURAL HISTORY OF THE LEUKEMIAS

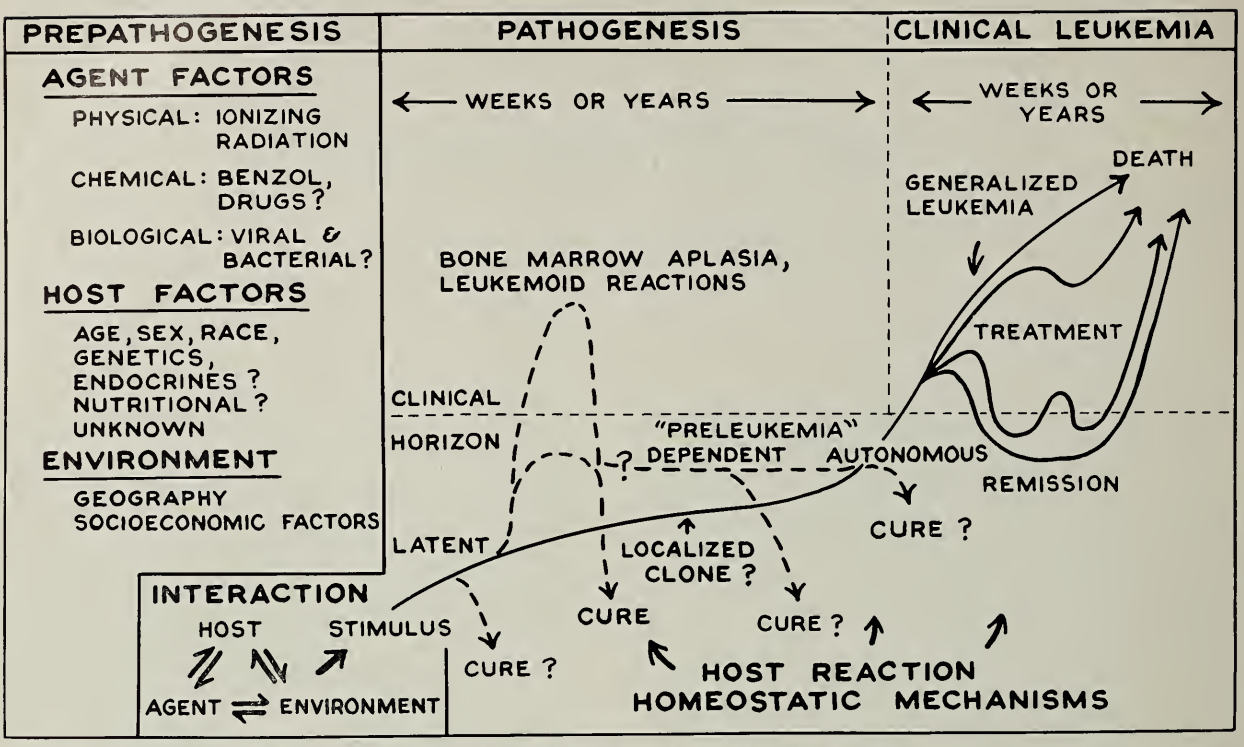


Chart 1.—Factors in the natural development of the leukemias. Leukemia is believed to develop through the interaction of a variety of host, agent, and environmental factors in the prepathogenesis period depicted in the left portion of the diagram. The period of pathogenesis, after the leukemogenic stimulus is initiated, is illustrated to the right of the vertical axis. The vertical axis denotes the extent of the disease process, and the horizontal line signifies time. The heavy line indicating the division between asymptomatic and symptomatic stages is designated as the "clinical horizon." Leukemia, as it progresses (shown by the graph line), may be symptomatic (above the horizon) or asymptomatic (below the horizon). The hypothetical relationship of the preleukemic state to the leukemoid reactions is shown by dotted lines. The course of the disease eventually terminates in death, but the effect of treatment may suppress the disease for varying, and limited periods of time. (After Leavell, H. G., and Clark, E. G.: Preventive Medicine, 2nd ed., McGraw-Hill Book Co., Inc. New York, 1958.)

novirus agglutinating antibodies occur in some patients with cancer.[60] However, to date no human leukemia-causing virus has been identified and there is no overt evidence that leukemia is contagious as are the common viral agents. The possibility of a viral cause of human leukemia opens exciting prospects for control by immunization. However, at present distinctions should be made between cell-free agents which induce leukemia under highly-structured laboratory conditions and those causing natural viral infections.

The leukemogenic action in man of such agents as ionizing radiations and benzol has long been accepted and precautions against undue exposure are widely practiced.[9,11,13] Recently, leukemia- and lymphoma-like conditions have been reported in human beings following exposure to insecticides[31] and the administration of anticonvulsant drugs.[51] These reports suggest that physicians should be alert to the potential biologic hazards arising from new industrial and therapeutic compounds.

The possible significance of genetic factors in the etiology of leukemia has been emphasized in a number of studies which indicate a greater incidence of leukemia in certain families and in identical twins.[30,55] The age of onset, the clinical features and the similarity in cell type are suggestive of common genetic factors, but the rarity of such cases indicates that additional factors must operate to produce the leukemic change. The recent discovery of viruses in the leukemias of animals which were originally considered to be genetically-determined has required a restatement of the role of genetic factors: namely, that the responsiveness of the cells to other agent factors is genetically determined. Recent demonstrations of chromosomal abnormalities in granulocytic leukemia and in acute leukemia in patients with mongolism[5,32,59] further support the concept of a genetic alteration in leukemic cells, but it is not certain whether the change represents a primary etiologic factor or is a manifestation of the disease process.

Important host factors, other than genetic, are age, sex and race. Each variety of leukemia has its own distinct age and sex incidence curve.[2,35] In general, the sex incidence does not change with

respect to age, and females show a persistently lower incidence than males, suggesting the influence of hormonal factors in the genesis of the disease. Acute leukemias are of highest incidence at the extremes of age, with the incidence in children showing a peak at 3 to 4 years, then steadily declining until 30 to 40 years, and then progressively increasing. The annual incidence has tended to level off in children,[21,42] while that in older persons has continued to rise throughout the world. In New Zealand 46 per cent of cases of acute leukemia occurred in persons over 50 years of age.[24] Chronic leukemias are extremely rare below the age of 15 years and show a progressive rise in incidence with increasing age. The incidence of chronic granulocytic leukemia reaches a peak in middle life, whereas chronic lymphocytic leukemia reaches its peak incidence in even more advanced years. The reports of a lower incidence of leukemia in Negroes than in Caucasians has been found to be closely associated with socioeconomic differences between the two groups. The increasing urbanization, higher incomes, and better medical care of Negroes have tended to erase this difference.[15,23]

It may be assumed that there is a variable, possibly reversible, latent period in leukemogenesis. Its duration is dependent upon a number of factors, including the nature and persistence of the agents and the competence of the homeostatic mechanisms in the host. The definition of leukemia given at the beginning of this presentation considers the disease to be due to a malignant change within the cell. On the basis of researches on animal neoplasms and from recent clinical observations,[14,16,18,43] this definition could be broadened to include "host-dependent" or "conditioned" leukemias, in which the abnormal cells and resulting clinical syndromes arise in response to an altered host environment, and not as a primary neoplastic change in leukocytes. Removal of the abnormal host stimulus leads to regression of the leukemic cells. At the other extreme are "autonomous" leukemias in which the leukocytes are irreversibly "malignant" and do not respond to regulating homeostatic mechanisms in the host.

Possibly there are no clear-out demarcations between dependent and autonomous leukemias, and an initially host-dependent cellular alteration might proceed from dependency to autonomy. The spontaneous remissions occasionally reported in acute leukemias may represent examples of host-dependent leukemias which still retain some responsiveness to homeostatic regulation. Possibly, as a result of disturbances in the hematopoietic tissues produced by chronic disease, viral infections, chemical and radiation damage, genetically-determined enzyme deficiencies, and other unrecognized factors, an alteration in the condition of the blood-forming organ occurs, resulting in bone marrow aplasia. Recovery might selectively favor the development of clones of cells possessing abnormal biochemical characteristics which would permit them to be progressively more independent of host control mechanisms, eventually leading to the establishment of autonomous leukemia. A clear-cut distinction between a leukemoid reaction, host-dependent leukemia and preleukemia cannot be made on morphological grounds alone.[18] It has been reported by several investigators that bone marrow aplasia may precede the onset of leukemia.[18]. Removal of the stimulating agent factor might result in the "dying out" of the leukemic state in most patients, except in a few genetically-conditioned hosts in whom the agent factor was more firmly established, or in whom autonomous cells had developed, analogous to the development of antibiotic resistant bacteria.

Recent clinical observations support the hypothesis that a "preleukemic" host-dependent phase of leukemia may exist for prolonged periods before typical systemic leukemia is clinically evident. Abnormalities have been reported in the blood and marrow of patients, often with leukemic blast cells, present for several years before the onset of leukemia.[4,13,50] Biochemical and morphological abnormalities were found in the leukocytes and platelets of the Hiroshima atomic bomb victims several years before chronic granulocytic leukemia developed in them.[39] It is reasonable to assume that similar abnormalities have developed in many other patients but have gone unrecognized and have subsided. Little data are available on the dynamic morphologic and biochemical functioning of the hematopoietic system in the ordinary benign viral and bacterial infectious diseases. This area deserves more critical study.

Clinical Considerations

Acute leukemia—childhood type. The diagnosis of acute leukemia in children is usually not difficult, and the clinical course is fairly uniform.[48,57] Most patients have varying degrees of general symptoms, such as malaise, loss of appetite, fatigue, weakness, fever and loss of weight. Early in the illness the symptoms and findings are related to the involvement of the blood forming organs and lymphatic tissue, producing symptoms relating to lymphadenopathy, splenomegaly, bone pain and tenderness. At this time the leukocyte count may be elevated, normal or subnormal, and always there are some abnormal immature blast forms.

Anemia is common and arises from the replacement of the normal bone marrow by leukemic cells and from peripheral hemolysis. Occasionally, in-

tractable hemolytic anemia precedes the development of acute leukemia, but seldom is it accompanied by the typical indications of acute hemolysis, such as jaundice and bilirubinemia. In most cases the anemia is a result of bone marrow failure. The tendency to bleed, ranging from easy bruisability and epistaxis to petechiae, occurs in association with thrombocytopenia. Symptoms of pressure may be produced by rapidly progressing enlargement of lymph nodes, particularly in the mediastinum; and later abdominal distention may result from enlargement of the spleen, liver and retroperitoneal nodes. Infections are particularly common and serious due to the impairment of the immune mechanism in leukemic subjects.

The bone marrow is typically replaced with blast forms, most frequently of the lymphoblastic type. Marrow infiltration by leukemic cells is often accompanied by decidedly elevated intramedullary bone marrow pressures.[46] This factor, in conjunction with periosteal infiltration, may account for the bone pain, tenderness and arthralgia so frequently seen in leukemic children.

In the later stages of acute leukemia, the impairment of such organs as the liver, kidney and central nervous system contributes to the symptoms and findings. An increase in intracranial complications in acute leukemia in children has been noted since the advent of chemotherapy which has resulted in prolonged survival times in many patients.[56]

Acute leukemia—adult type. The onset of clinical symptoms in the adult, and particularly in the older patient, differs from those seen in children in that it resembles that of the chronic leukemias. However, it becomes sharply different in clinical course by the time the diagnosis has been established.[24] This insidious onset is in contrast to most cases of acute leukemia in young patients. Of additional significance are the paucity of abnormal physical findings, the variability in hematological findings and the poor response to therapy in the acute leukemias of older patients as contrasted to both chronic leukemias and acute leukemia in children. Symptoms such as fatigue, loss of appetite, infections, breathlessness and hemorrhages, and findings of fever, pallor, purpura and bleeding occur in most of the patients. Organ enlargement, such as splenomegaly, lymphadenopathy and hepatomegaly, is infrequent. Hematologic findings are often extremely variable and do not correlate well with the duration and character of the clinical course. Usually, moderate normocytic, normochromic anemia and thrombocytopenia are present. The number of leukocytes is extremely variable and may range from severe leukopenia to pronounced leukocytosis. The differential counts, also variable, usually will contain some immature blast forms which will establish the diagnosis. In acute leukemias of adults the proportions of the lymphoblastic, myeloblastic and monoblastic forms are equal.

In general, the diagnosis of acute leukemia is relatively easy. It is based upon the clinical features already mentioned and the specific presence of blast cells in the blood and bone marrow. It must be differentiated from infectious mononucleosis and infectious lymphocytosis in children, and from such conditions as aplastic anemia, metastatic carcinoma, infections and toxic bone marrow depression in adults.

It has been determined that the morphologic type of leukemia cell has a bearing on the effectiveness of various chemotherapeutic agents.[29,57] Generally, both children and adults with lymphoblastic leukemia have shown excellent initial responses to corticosteroids and to antimetabolites, while patients with myeloblastic and monoblastic leukemia do not respond to any significant degree. The greater proportion of the latter two types of disease in adults may account for the poor response to therapy reported in acute leukemia of adults. The condition of untreated patients deteriorates progressively, with death eventually due to widespread hemorrhage or to generalized sepsis. Spontaneous remissions of varying degrees have been reported in 8 to 10 per cent of untreated patients. These respites, which last for approximately six weeks, are often preceded by infections or other forms of stressful illness.[45,57]

Treatment

As a result of intensive clinical and laboratory investigations, many new chemotherapeutic agents are being developed for the management of the leukemias. At present, the agents of established clinical value in children are the corticosteroids, 6-mercaptopurine (Purinethol®), and amethopterin (Methotrexate®). In adults the antifolic antimetabolites (Methotrexate®) are quite toxic and have limited use. A number of treatment programs employing these agents have been investigated. Basic to all management is the concept of "total care," in which careful and constant attention is given to all symptoms and findings, whether or not leukemic in origin. It is anticipated that the antipyrimidine antimetabolites currently under investigation will offer additional selective and useful compounds for clinical use.[40]

In patients who are symptomatic and acutely ill it is customary to employ the corticosteroids until remission is produced. Prednisone is administered in doses of 30 to 100 mg, orally, per day, and is discontinued after ten to fourteen days if the pa-

tient shows improvement. In addition, at the outset of therapy, Methotrexate in oral doses of 2.5 to 5 mg per day is given and continued indefinitely until resistance and clinical relapse occur. At this time the drug is discontinued and 6-mercaptopurine, 3 mg per kilogram of body weight per day is administered by mouth until a second relapse occurs. Patients seldom respond dramatically to a second trial of Methotrexate, but it may be reinstituted at this time.

During treatment with antimetabolite drugs the oral mucosa should be carefully observed for the development of shallow ulcerations which are characteristic of toxicity, especially with Methotrexate. In such instances, the drug should be discontinued temporarily. As it has been determined that treatment for three to six weeks may be necessary for the full therapeutic benefit of the antimetabolites to be evident, treatment should be continued even though clinical improvement is slow. The corticosteroids may be employed at any time there is acute systemic toxicity, or in the presence of hemolytic anemia and thrombocytopenia. In adults, a similar therapeutic program is employed. However, because of its more severe toxic effects, Methotrexate is seldom employed. Recently, it has been reported that remissions may be obtained in adults with Methotrexate following the development of resistance to 6-mercaptopurine.[6] The role of such new agents as 5-FUDR and Vincristine sulfate in the management of acute leukemia is still under evaluation. Due to the severe toxicity associated with their use, they cannot be recommended at present and they are not advised for ambulatory patients.

Blood transfusions are employed when the hemoglobin falls below 8 gm per 100 ml or in the event the patient has symptoms related to anemia. Attempts to maintain the hemoglobin levels at normal values are usually without success and expose the patient to the possible hazards of transfusion reactions, hepatitis and other complications.[20,47] Antibiotics are employed for specific infections and are not used prophylactically. Transfusions of bone marrow have no practical role in the management of acute leukemia.

In approximately 75 per cent of children and adults with acute lymphocytic leukemia, the corticosteroids bring about complete or partial clinical and hematological remissions.[29] In children, the remission rate with 6-mercaptopurine is 45 per cent, and with Methotrexate 30 per cent.[41,48] The duration and completeness of remissions vary, but the average duration is 6.5 weeks with corticosteroids and 11 weeks with 6-mercaptopurine. Complete clinical and hematologic remissions occur in approximately 30 per cent of children.[57] Complete remissions in adults are unusual, and only 20 to 25 per cent achieve partial remissions.[7] While second remissions are common in children, they are quite unusual in adults. As the result of intensive total care, including antileukemic chemotherapy, and supportive measures, such as blood transfusions and antibiotics, the survival time of children with acute leukemia has been increased by from six to twelve months.[41] Adults with acute leukemia do not obtain this degree of benefit from treatment.

Chronic granulocytic leukemia. Chronic granulocytic leukemia is usually a well-defined clinical entity among leukemic syndromes. It is marked by a great increase in leukocytes, composed of myelocytes, metamyelocytes and mature granulocytes, and almost always by splenomegaly, which is often massive. In general, an exponential increase in leukocyte counts precedes the enlargement of the spleen, fall in hemoglobin, increase in the basal metabolic rate and the onset of symptoms. When the leukocytes fall to normal following treatment, the signs and symptoms subside. Chronic granulocytic leukemia is considered by certain hematologists to be a member of a group of diseases characterized by abnormal proliferation of the hematopoietic stem cells in the bone marrow, which may affect the granulocytes in chronic granulocytic leukemia, the erythrocytes in polycythemia vera and erythroleukemia, and the marrow reticulum cells in myelofibrosis.[12]

The clinical symptoms of chronic granulocytic leukemia are of insidious onset. There may often be a prolonged period during which general health is unimpaired, although abnormalities in the blood indicate the presence of the disease. The usual signs of weakness, tiredness, lack of initiative and the like are present. A heavy abdominal sensation, and abdominal and left shoulder pain may lead the patient to the discovery of a splenic mass. Less frequently, the patient may at first have symptoms suggestive of hyperthyroidism or those relating to anemia. Physical signs in early disease are few. Splenic enlargement is present in almost all cases, while hepatomegaly is found in about half the patients. Lymphadenopathy is unusual. Petechiae and purpuric areas on the extremities are infrequent.

Diagnosis is made on the basis of hematologic features, which usually are characteristic. Pronounced elevation of leukocyte count—100,000 to 300,000 per cu mm—is found in about half of the patients, the remainder showing lesser elevations. The increase is due to an excess of the granulocytic series, myelocytes to granulocytes, including the eosinophils and basophils. Myeloblasts and promyelocytes are also increased. The bone marrow is hyperplastic in all series, with a decided shift to the left, but these features may be difficult to distinguish from those of a severe myelocytic response

to infection. The presence of increased numbers of eosinophils and basophils is of diagnostic value in leukemia, and helps to differentiate the leukocytosis from reactions due to bacterial infections where these cell types are decreased. The alkaline phosphatase reaction may be of additional value in differential diagnosis of leukemia and infection. The granulocytes of chronic granulocytic leukemia give no histochemical reaction for alkaline phosphatase, whereas in infections, polycythemia vera and pregnancy the reaction is decidedly positive. This test is not, however, absolutely reliable, for occasional patients with leukemia have been found to have positive reactions. Platelet counts are usually normal or elevated in the early stages of the disease. Some degree of anemia is usually present, but the hemoglobin levels are seldom under 10 to 11 gm per 100 ml in the early phase. Later in the clinical course of the disease, acute clinical manifestations develop in many patients. These take the form of severe myeloblastic proliferation or "myeloblastic crisis," and the clinical signs and symptoms of acute leukemia are exhibited. It is believed that this change is a step in the natural sequence of stages of the disease and is not induced by therapy.

As was emphasized above, the clinical symptoms and the course of chronic granulocytic leukemia are related to the leukocyte level and its rate of increase. Treatment is directed toward the control of the granulocyte level. All patients with leukocytes over 15,000 per cu mm should be treated. The goal of treatment is to reduce and maintain the granulocytes at normal levels, and to produce a rise in hemoglobin concentration to normal. The most important forms of treatment are chemotherapy with busulfan (Myleran®), systemic radiation therapy with P^{32}, and local splenic x-irradiation. Therapy in the early stages of the disease produces a prompt decrease in spleen size and fall in the leukocyte count, which are associated with subjective clinical wellbeing. Busulfan is considered to be the treatment of choice by hematologists because of ease of administration, freedom from side effects and low cost. Also it permits personal regulation of the hemogram by the clinician. Equally beneficial results have been reported by experienced radiotherapists using P^{32} and splenic x-irradiation. The physician not familiar with the use of chemotherapeutic agents should consult a hematologist or radiotherapist for assistance in treating leukemic patients.

Initial chemotherapy consists of busulfan by mouth, 4 mg daily, until the number of leukocytes falls to below 12,000 per cu mm. The count is checked weekly and the drug is discontinued when leukocytes reach 8,000 to 10,000 per cu mm. Maintenance therapy is advisable if the leukocyte count doubles within one month after discontinuance of the initial course of treatment. Usually a dose of 2 mg of busulfan daily will control most patients, but as the disease continues it may be necessary to increase the dose to 6 or 8 mg daily to maintain the granulocyte count at normal levels. Eventually resistance to busulfan develops, and the disease is not controlled by increasing doses of the drug; the hemoglobin falls, the spleen enlarges, and the differential count shows increasing cellular immaturity with large numbers of myeloblasts. At this point, treatment with busulfan is discontinued and the patient is treated with 6-mercaptopurine in the manner outlined for acute leukemia in adults. Only partial and temporary success follows this treatment, with the leukocyte count falling, but with little or no change occurring in the bone marrow myeloblastosis. While some clinical improvement may occur, no true remissions are produced. Other chemotherapeutic agents such as nitrogen mustard, triethylene melamine (TEM), chlorambucil and cyclophosphamide are not as effective as busulfan, which will control the disease in 90 per cent of patients.[25,34,54] Demecolcin has been reported to control the early phase of the disease, but considerable experience in its use is necessary and the remission times produced are shorter than with busulfan.

Radiation therapy to the spleen is often of value when persistent splenomegaly refractory to busulfan occurs. Radioactive phosphorus P^{32} is excellent for control of systemic granulocytic leukemia and gives about the same degree of benefit as busulfan.[8,33,44,49] The corticosteroids are seldom necessary in the early phases of chronic granulocytic leukemia but are of considerable symptomatic value in the acute myeloblastic stage.

According to recent statistical data, the median survival time from diagnosis to death is about ten months in unselected series, with a five-year survival of 5 to 10 per cent. Three-year and five-year survivals of 50 per cent and 20 per cent, respectively, have been reported by several investigators.[25,44]

Chronic lymphocytic leukemia. The two chronic forms of leukemia differ sharply in their clinical features. While chronic granulocytic leukemia follows a predictable and uniform pattern, chronic lymphocytic leukemia is highly variable in its symptoms, clinical and hematological manifestations, course and response to treatment. It is marked by the proliferation and accumulation of lymphocytes throughout the blood forming organs. The lymphocytes are usually mature, and the lymph nodes are uniformly replaced with small lymphocytes. Occasionally in the early stages of the disease an increase of lympho-

cytes in the blood is not demonstrated, leading to the diagnosis of lymphosarcoma. Because of the unpredictability and variability of the disease, management demands good clinical judgment and therapeutic experience. The number and size of the enlarged lymph nodes and the size of the liver and spleen may bear no relationship to the level of the leukocyte count or to the extent of bone marrow infiltration. Patients may often have extremely high leukocyte counts and be asymptomatic. Chronic lymphocytic leukemia does not terminate in acute leukemia: most deaths from the disease are due to complications of severe hemolytic anemia, to intractable infections due to impaired immune mechanisms, or to uncontrolled bleeding due to thrombocytopenia.

The reasons for which patients first seek medical help are variable. Included among them are enlargement of lymph nodes, lassitude, loss of weight and symptoms relating to anemia—dyspnea and angina pectoris, abdominal pain and distention, bleeding, infections and edema. Infections are an important feature in chronic lymphocytic leukemia, where immunological defects occur from defective antibody production and from qualitative and quantitative deficiencies in gamma globulin.[38] Commonly occurring infections are pneumonia, bronchitis, sinusitis, furuncles and herpes zoster. Patients may be discovered to have chronic lymphocytic leukemia through routine blood counts made during health maintenance examinations.

The usual clinical findings are generalized, moderate and non-tender enlargement of superficial lymph nodes, accompanied by moderate spleen and liver enlargement. Infrequently the only findings may be localized splenomegaly or enlargement of one lymph node group.

The diagnosis is based on clinical symptoms and findings, hematological changes and lymph node biopsy. Most patients have leukocyte counts between 20,000 and 100,000 per cu mm, with a predominance of small lymphocytes. In patients with normal total leukocyte counts, there is an absolute increase in the lymphocyte count over 4,500 per cu mm. The bone marrow may be diffusely infiltrated with small lymphocytes, or contain nodular infiltrates when seen in histological sections. Lymph node biopsy will show diffuse infiltration and obliteration of the normal morphologic structure of the node, with small or medium sized lymphocytes. The essential difference in the nodes from those found in lymphosarcoma is the presence of increased numbers of lymphocytes in the blood vessels of the leukemic lymph node.

Abnormalities of serum proteins are often present, including hypogammaglobulinemia and agammaglobulinemia. In a significant number of patients, hemolytic anemia is found, but rarely is it associated with the classic signs of hemolysis, such as bilirubinemia, increase in urobilinogen and reticulocytosis. The Coombs test is infrequently positive, but studies of erythrocyte lifespan indicate a shortened survival time. Thrombocytopenias are caused by autoimmune mechanisms and will often respond to treatment with corticosteroids.

Treatment of chronic lymphocytic leukemia presents problems different from those found in chronic granulocytic leukemia, where the patient can confidently expect a complete remission of variable duration. Such remissions are rarely produced in chronic lymphocytic leukemia. Although lymph nodes may shrink and the lymphocyte count fall, general improvement of health and correction of anemia are rare. The physician must determine whether or not treatment is indicated. In asymptomatic patients with the disease restricted to lymphocytosis in the peripheral blood, it is probably reasonable to withhold treatment. Disagreement exists on whether or not to treat when only slight adenopathy and lymphocytosis, and no significant anemia, are found. Some hematologists believe that all patients should be treated at this point since the prognosis of the disease is in general poor, with a median survival time of about one year.[15] When symptoms develop, patients will demand treatment.

Several therapeutic means exist for treatment of chronic lymphocytic leukemia, including localized x-irradiation therapy, systemic radiation therapy with P^{32}, chemotherapy with an alkylating agent such as chlorambucil, and corticosteroids. Local x-ray therapy is useful in early disease for shrinking localized lymphadenopathy, such as cervical, mediastinal and splenic masses, but it has variable effects upon the lymphocyte count. Systemic therapy with chlorambucil or with P^{32} is employed in patients in whom symptoms are caused by failure in general health and who have generalized lymphadenopathy and bone marrow disease. As indicated previously, the physician not familiar with chemotherapeutic agents should seek consultation with a hematologist or refer the patient to a radiotherapist. It is important to avoid bone marrow depression when employing systemic chemo- or radiation therapy, for sudden bleeding from thrombocytopenia, or infection associated with granulocytopenia may develop.

Alkylating drugs will decrease the number of lymphocytes and the enlargement of organs in most patients. Chlorambucil (Leukeran®) is probably the most effective and easily managed oral agent.[19,54] TEM and cyclophosphoramide (Cytoxan®) are less manageable and have serious drawbacks. The dose of chlorambucil is 0.1 to 0.2 mg per kilogram of body weight daily. Complete blood cell counts are

done twice weekly and the treatment is continued for four to eight weeks, with careful attention paid to the platelet and hemoglobin levels. The goal of therapy is to bring the leukocyte count to normal and to eliminate the systemic manifestations of the disease. However, the control of the leukocyte count is difficult and the risk of bone marrow damage from the drug is a definite threat. Often the physician must be content to reduce the lymphocyte count to 20,000 to 25,000 per cu mm. Chemotherapy must be used with caution when the platelets are below 50,000 to 100,000 per cu mm. In such cases, the only agent available for therapy is prednisone, which may often produce pronounced lympholytic effects and temporary clinical improvement. Hemolytic anemia may respond dramatically to prednisone in doses of 40 to 60 mg a day. Thrombocytopenia is less easily affected by prednisone. Corticosteroid therapy is usually not continued for more than two to three weeks in elderly patients, where complications resulting from sodium retention are frequent. A few patients will respond to the outlined treatment in dramatic fashion for prolonged periods. Others do less well and require a course of treatment every few months. The majority have little or no real benefit, despite a decrease in lymphadenopathy and in lymphocyte count. A small number of patients are actually harmed as the result of bone marrow depression produced by treatment.

The usual natural history of chronic lymphocytic leukemia is a period of fair health during which the lymph nodes and spleen increase slowly in size and the lymphocyte count creeps upward, although the hemoglobin concentration and platelet count may remain normal. Treatment at this time produces lymph node and splenic regression and some subjective improvement. With varying degrees of abruptness, related to lymphocytic infiltration, the bone marrow fails and anemia and thrombocytopenia occur. Therapy is of transient effect at this stage. At any time during the course of the disease, complications such as skin infiltrations, infections and autoimmune syndromes may develop. The median survival time in unselected patients is about 12 months.[15] However, in selected and well-managed patients, better results are obtained, with median survival of over three years.[44,54] The variability in the prognosis is illustrated by reports of extremely long survival of individual patients.[36]

The leukemias are under continuous and intensive investigation in laboratories throughout the world. It may be anticipated that important advances will be made in epidemiologic and pathophysiologic knowledge of these diseases, which will lead to the development of more effective and less toxic chemotherapeutic agents; and possibly to the development of immunologic methods for control in the event that leukemia in humans is found to be caused by a virus or viruses.

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REFERENCES

Dameshek, W. and Gunz, F.: Leukemia, 2nd ed., Grune & Stratton, Philadelphia, Pa., 1964, 594 pp.

Furth, J. and Baldini, M.: "Leukemia" In The Pathophysiology of Cancer, Hoeber, 1958, 2nd ed., 1180 pp.

Wintrobe, M. M.: Clinical Hematology, 5th Ed., Lea & Febiger, Philadelphia, Pa., 1961, 1186 pp.

1. American Cancer Society Symposium: The possible role of viruses in cancer, Cancer Res. 20:669, 1960.

2. Best, W. R. and Limarzi, L. R.: Age, sex, race, and hematologic classification of 916 cases of leukemia, J. Lab. & Clin. Med. 40:778, 1962.

3. Best, W. R., Limarzi, L. R. and Poncher, H. G.: Longevity in leukemia, J. Lab. & Clin. Med., 38:789, 1951.

4. Block, M., Jacobson, L. O., and Bethard, W. F.: Preleukemic human leukemia, J. Am. Med. Assn., 152:1018, 1953.

5. Buckton, K. E., Jacobs, P. A., Court-Brown, W. M., and Doll, R.: A study of the chromosome damage persisting after x-ray therapy for ankylosing spondylitis, Lancet, 2:677, 1962.

6. Burchenal, J. H., and Ellison, R. R.: Chemotherapy of human leukemia. In Progress in Hematology, Grune & Stratton, New York, 1956.

7. Burchenal, J. H. and Karakoff, I. H.: Newer agents in the treatment of leukemia, Arch. Int. Med.: 96:567, 1956.

8. Chodos, R. B. and Ross, J. F.: The use of radioactive phosphorus in the therapy of leukemia, polycythemia and lymphomas, Ann. Int. Med., 48:956, 1958.

9. Court-Brown, W. M.: Radiation induced leukemia in man with particular reference to the dose-response relationship, J. Chronic Dis., 8:113, 1958.

10. Crick, F. H. C.: The genetic code, Sci. Am., 207:66, Aug. 1962.

11. Cronkite, E. P.: Evidence for radiation and chemicals as leukemogenic agents, Arch. Environ. Health, 3:297, 1961.

12. Dameshek, W.: Some speculations on the myeloproliferative syndromes, Blood, 6:372, 1951.

13. Dameshek, W. and Gunz, F.: Leukemia, Grune & Stratton, New York, 1958, 420 pp.

14. Farber, S., Haddow, A., and Heller, J. R. (Editors): Symposium on cancer, J. Chronic Dis., 8:1-190, 1958.

15. Feinleib, M. and MacMahon, B.: Variations in the duration of survival of patients with chronic leukemias, Blood, 15:332, 1960.

16. Foulds, L.: The natural history of cancer, J. Chronic Dis., 8:2, 1958.

17. Furth, J.: A meeting of the ways in cancer research: Thoughts on the evolution and nature of neoplasms, Cancer Res., 19:241, 1959.

18. Furth, J. and Baldini, M.: Chapter on Leukemia. In "The Pathophysiology of Leukemia." Hoeber, 1958, 2nd ed., 1180 pp.

19. Galton, D. A. G., Wiltshaw, E., Szur, L. and Dacie, J. V.: The use of chlorambucil and steroids in the treatment of chronic lymphocytic leukemia, Brit. J. Haemat. 7:73, 1961.

20. Gardner, F. H.: Problems of multiple transfusions, Calif. Med., 88:93, 1958.

21. Gilliam, A. G.: Age, sex and race selection at death from leukemias and lymphomas, Blood, 8:698, 1953.

22. Goldthwait, D. A.: Nucleic acids and cancer, Am. J. Med., 29:1034, 1960.

23. Gordon, T., Crittenden, M., and Haenszel, W.: Cancer mortality trends in the United States 1930-1955, J. Nat. Cancer Inst. Monograph No. 6, Sept. 1961. Leukemia, p. 279.

24. Gunz, F. W. and Hough, R. I.: Acute leukemia over the age of fifty: A study in its incidence and natural history, Blood, 11:882, 1956.

25. Haut, A., Cartwright, G., and Wintrobe, M. M.: Busulfan in the treatment of chronic myelocytic leukemia. The effect of long term intermittent therapy, Blood, 17:1, 1961.

26. Heath, C. W., Jr. and Hasterlik, R. J.: Leukemia among children in a suburban community, Am. J. Med. 34:796-812, 1963.

27. Heyn, R. M., Brubaker, C. A., Burchenal, J. H., Crambblett, H. G., and Wolff, J. A.: Comparison of 6-mercaptopurine with combinations of 6-mercaptopurine and azaserine in treatment of acute leukemia in children, Blood, 15:350, 1960.

28. Hueper, W. C.: Carcinogens in the human environment, Arch. Path., 71:237 and 355, 1961.

29. Hyman, C. B., Borda, E. C., Brubaker, C., Hammond, D., and Sturgeon, P.: Prednisone in childhood leukemia, Pediatrics, 24:1005, 1959.

30. Iochim, H.: Acute leukemia in uniovular twins. Review of genetic aspects of human leukemia, Cancer, 15:539, 1962.

31. Jedlica, V., Hermanska, Z., Smida, I., and Kouba, A.: Paramyeloblastic leukemia appearing simultaneously in two blood cousins after simultaneous contact with gammexane (Hexachlorcyclohexane), Acta Med. Scandinav., 161:447, 1958.

32. Johnson, A. W.: The chromosomes in a child with mongolism and acute leukemia, New England J. Med., 264:591, 1961.

33. Lawrence, J.: The treatment of chronic leukemia, Med. Clin. North America, 38:525, 1954.

34. Louis, J.: Management of reticuloendothelial malignancies, Med. Clin. North America, 46:171, 1962.

35. MacMahon, B. and Clark, D.: Incidence of the common forms of leukemia, Blood, 15:332, 1960.

36. Marlow, A. A. and Bartlett, G. R.: Survival for twenty-nine years in chronic lymphocytic leukemia, J. Am. Med. Assoc., 152:1033, 1953.

37. McAllister, R. and Goodheart, C. R.: Viruses and Cancer, Am. J. Dis. Child., 104:87, 1962.

38. Miller, D. G., Budinger, J. M., and Karnofsky, D. A.: A clinical and pathological study of resistance to infection in chronic lymphocytic leukemia, Cancer, 15:307, 1962.

39. Moloney, W. C. and Lange, R. D.: Leukemia in atomic bomb survivors II. Observations on early phases of leukemia, Blood, 9:663, 1954.

40. Morrison, B. H. (Editor): Conference on experimental clinical cancer chemotherapy, J. Nat. Cancer Inst., Monograph No. 3, 1960.

41. Murphy, M. L.: Leukemia and lymphoma in children, Pediat. Clin. North America, 6:611, 1959.

42. Mustacchi, P., Shonfeld, E. M., and Lucia, S. P.: Survival in acute leukemia: The influence of blood groups, sex, and age at onset, Ann. Int. Med., 52:68-72, 1960.

43. Osgood, E. E.: Unifying concept of leukemia, lymphomas, and cancers, J. Nat. Cancer Inst. 18:155, 1957.

44. Osgood, E. E., Seaman, A. J. and Koler, R. D.: Results of 15 year program of treatment of chronic leukemias with titrated regularly spaced total body irradiation with phosphorus-32 or x-ray. In Proc. Internat. Soc. Hemat. (6th Internat. Congr.) Grune & Stratton, New York, 1958, p. 44.

45. Pelner, L., Fowler, G. A., and Naums, H. C.: Effects of concurrent infections and their toxins on the course of leukemia, Acta Med. Scandinav., 162: Suppl. 338, 1958.

46. Petrakis, N. L.: Bone marrow pressures in leukemic and non-leukemic patients, J. Clin. Invest., 33:27, 1954.

47. Petrakis, N. L. and Politis, G.: Prolonged survival of viable, mitotically competent, mononuclear leukocytes in stored whole blood, New. Eng. J. Med., 267:286, 1962.

48. Pierce, M. I.: Acute leukemias of childhood, Ped. Clin. North America, 4:497, 1957.

49. Reinhard, E. H., Nealy, C. L., and Samples, D. M.: Radioactive phosphorus in treatment of chronic leukemias. Long-term results over a period of 15 years, Ann. Int. Med., 50:942, 1959.

50. Rowen, M. J.: Problems in the diagnosis of leukemia, Ann. Int. Med., 46:907, 1957.

51. Saltzstein, S. L. and Ackerman, L. V.: Lymphadenopathy induced by anticonvulsant drugs and mimicking clinically and pathologically malignant lymphomas, Cancer, 12:164, 1959.

52. Schoolman, H. M.: Clinical implications of viral studies in leukemia, 46:165, 1962.

53. Shimkin, M. B.: On the etiology of cancer, J. Chronic Dis., 8:38, 1958.

54. Southeastern Cancer Chemotherapy Cooperative Study Group: Comparison of chlorambucil and myleran in chronic lymphocytic and granulocytic leukemia, Am. J. Med., 27:424, 1959.

55. Steinberg, A. G.: The genetics of acute leukemia in children, Cancer, 13:985, 1960.

56. Sullivan, M. P.: Intracranial complications of leukemia in children, Pediatrics, 20:757, 1957.

57. Tivey, H.: The natural history of untreated acute leukemia, Ann. N.Y. Acad. Sc., 60:322, 1954.

58. Tivey, H. and Moffat, C. A.: Prognosis for survival in chronic granulocytic and lymphocytic leukemia, Am. J. Roentgenol., 72:68, 1954.

59. Tough, I. M., Court-Brown, W. M., Baikie, A. G., Buckton, K. E., Harnden, D. G., Jacobs, P. A., King, M. J., and McBride, J. A.: Cytogenetic studies in chronic myeloid leukemia associated with mongolism, Lancet, 1:411, 1961.

60. Trentin, J. J., Yabe, Y., and Taylor, G.: Tumor induction in hamsters by human adenovirus, Proc. Am. Assoc. Cancer Res., 3:369, 1962.



CASE REPORTS

An Unusual Central Nervous System Complication of Mumps

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MUMPS IS USUALLY CONSIDERED to be an acute, self-limited infectious disease with a high morbidity but low mortality. The disease is generalized and manifests itself in such areas as the parotid gland, the gonads and the pancreas; involvement of the nervous system can be seen as meningitis, encephalitis, myelitis or polyradiculitis. The incidence of mumps meningitis is quite common, whereas mumps encephalitis and mumps myelitis are relatively uncommon and the occurrence of both together is rare and often fatal. In 1956, Miller and coworkers[1] reviewed the literature and found only 27 cases of mumps encephalitis since 1934; myelitis was a feature in two of these cases. Scheid,[2] in his review of the literature in 1961, reported 17 cases of myelitis without encephalitis.

The case here reported was one of severe mumps encephalitis and myelitis following obvious bilateral parotid gland infection, with complete functional recovery.

Report of a Case

On February 26, 1963, a comatose 15-year-old white girl was admitted to Children's Hospital an hour and a half after a convulsive episode that had occurred five days after the appearance of bilateral parotid gland swelling that had been diagnosed as mumps. She had been doing well until the sudden onset of seizures. The patient had never had any seizures in the past and there was no history of familial neurological disease.

On admission the patient was in deep coma. Body temperature was 38° C, blood pressure 165/80 mm of mercury, the pulse rate 148 and respirations 16 per minute. No abnormalities were noted on examination of the blood or on urinalysis. Serum electrolytes were within normal limits.

There was no response to pinprick or to deep pressure stimulation. The limbs were very hypotonic. The deep tendon reflexes were absent except for a 1 plus biceps response. The plantar responses were not obtainable. An admission diagnosis of mumps encephalitis was made.

In addition to the lumbar puncture findings (Table 1), complement fixation against mumps on admission showed serum titer of 1:32. One month later, studies with paired sera revealed a titer of 1:256.

The patient was given general supportive care and remained in coma for about four days. She roused gradually over the next four to five days and began to react and respond intelligently. During this time it became apparent that she was paraplegic and also anesthetic to the level of the xyphoid process. She

TABLE 1.—*Data on Lumbar Puncture and Spinal Fluid Examination*

	Admission February 26	*March 8*
Lumbar puncture		
Opening pressure (mm water)	480	170
Closing pressure (mm water)	370	140
Fluid	clear	clear
Protein (mg per 100 ml)	106	52
Sugar (mg per 100 ml)	90	72
Red blood cells	64, some crenated	0
White blood cells	155*	12 lymphocytes
Culture	no growth	no growth

*Equal polymorphonuclears and lymphocytes.

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Submitted November 7, 1963.

had had urinary retention since the admission and required an indwelling catheter.

Lumbar puncture was repeated on March 8 (Table 1). By this time the patient had begun to show slow but progressive improvement. Both arms were normal and there were flickers of movement in the left leg. The right leg remained flaccid. Deep tendon reflexes were normal in the upper extremities but absent in the lower. Plantar responses were flexor. The patient complained of severe hyperesthesia in the legs, yet response to pinprick was poor.

On March 11 an electromyelogram of the left anterior tibia, left quadriceps and left peroneus longus was done. Neither denervation nor action potentials, either voluntary or involuntary, was noted. With the obvious bilateral paralysis present it was assumed that it was too early for denervation potential to appear. The sensory deficit to the third thoracic nerve remained. Strength in the lower extremities continued to improve in the left leg more than the right. Deep tendon reflexes varied—on this day they were absent and an extensor plantar response was present in the right leg.

An electroencephalogram on March 20 was interpreted as diffusely abnormal with more severe involvement on the left without any indication of focal disturbance. Movement and strength in the legs continued to improve and still continued to be better on the left.

On March 25 the plantar responses were extensor bilaterally. The sensory deficit persisted, seemingly more on the right side. The patient still required an indwelling catheter.

By April 4 the sensory deficit had cleared completely but weakness persisted, particularly on the right. Knee jerks were absent and ankle reflexes were 2 plus. Plantar responses were now flexor bilaterally.

A week later the muscle strength was much improved. The patient was now able to void voluntarily, but did have a great deal of urgency. A psychological evaluation done at this time, using the WISC and Bender Gestalt tests, was interpreted as normal.

On an encephalogram April 25 the previous lateralization was no longer present.

An electromyograph of bilateral quadriceps, anterior tibia, and gluteus maximus revealed some fibrillation potentials in all the muscles studied. In addition, there were voluntary action potentials of an abnormal pattern. On comparison with a tracing early in the time in hospital (March 11) it was felt that there was considerable evidence of re-innervation but that denervation potentials typical of a lower motor neurone disease were still present.

At the time of discharge on April 27 there was demonstrable weakness of the lower extremities, particularly in the hips, but the patient was able to ambulate very well on crutches.

On muscle examination May 3 weakness in the lower extremities was noted, particularly in the entire hip girdle and the right anterior tibia, but there was considerable improvement over the preceding examination. The deep tendon reflexes were present and equal bilaterally. There was no impairment of sensation. The patient was still using the crutches for walking.

By May 17 it was felt that remarkable strength had been gained in the hip girdle, hamstrings and anterior tibialis. The patient could do all normal functional activities except squat on her legs singly. The reflexes were normal. It was decided to abandon the use of the crutches.

On June 28 the examination was normal except for the fact that the patient still had some difficulty in getting up from the squatting position. In addition, she still complained of some minor difficulty because of the urgency she encountered with voiding.

Comment

Although infection with mumps virus has always been considered a relatively benign condition, in the present case the original complications were severe and the early prognosis rather grave. Miller and coworkers[1] reported on a group of about ten patients with encephalitis and convulsions, three of whom died. In the group of cases of myelitis without encephalitis that Scheid[2] reported, complete recovery occurred in about 50 per cent, the mortality was about 25 per cent and 25 per cent were left with some residual weakness. So far as we could determine there have been no reports on the prognosis of patients with the combination of encephalitis and myelitis that occurred in the present case. Fortunately, the patient has shown complete functional recovery in spite of some minimal residual weakness.

Summary

A case is reported of mumps encephalitis, followed by transverse myelitis, with a detailed history of the clinical course. It appears that complete recovery will probably occur.

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REFERENCES

1. Miller, H. G., Stanten, J. B., and Gibbons, J. L.: Para-infectious encephalomyelitis and related syndromes, Quart. J. Med., 25:427, 1956.

2. Scheid, W.: Mumps virus and the central nervous system, World Neurol., 2:117, 1961.

Severe Valvar Pulmonary Stenosis

Successful Surgical Treatment with Hypothermia and Inflow Occlusion In the First Week of Life

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ALTHOUGH ADVANCEMENTS have been made during the past decade in the surgical techniques for the correction of congenital heart lesions, the clinical application of these technical achievements has been largely limited to patients over two years of age, and only meager progress has been made in the surgical management of severe cardiac problems in neonates and small infants.[1] Since approximately 35 per cent of babies born alive with heart anomalies die at less than two months of age and 50 per cent do not survive the first year,[4] it seems obvious that the mortality rate from congenital heart defects will continue to be high until further progress is made in the diagnosis and treatment of such lesions in neonates and small infants.

Approximately 60 per cent of the corrective surgical procedures for neonates and infants require the use of open heart techniques.[1] This does not necessarily mean that cardiac bypass is required, since many of the open heart procedures can be performed satisfactorily by use of hypothermia and/or inflow venous occlusion.[2] In the case here reported a baby with severe valvar pulmonary stenosis had successful correction by open heart operation using inflow occlusion and hypothermia at the age of six days.

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Submitted November 1, 1963.

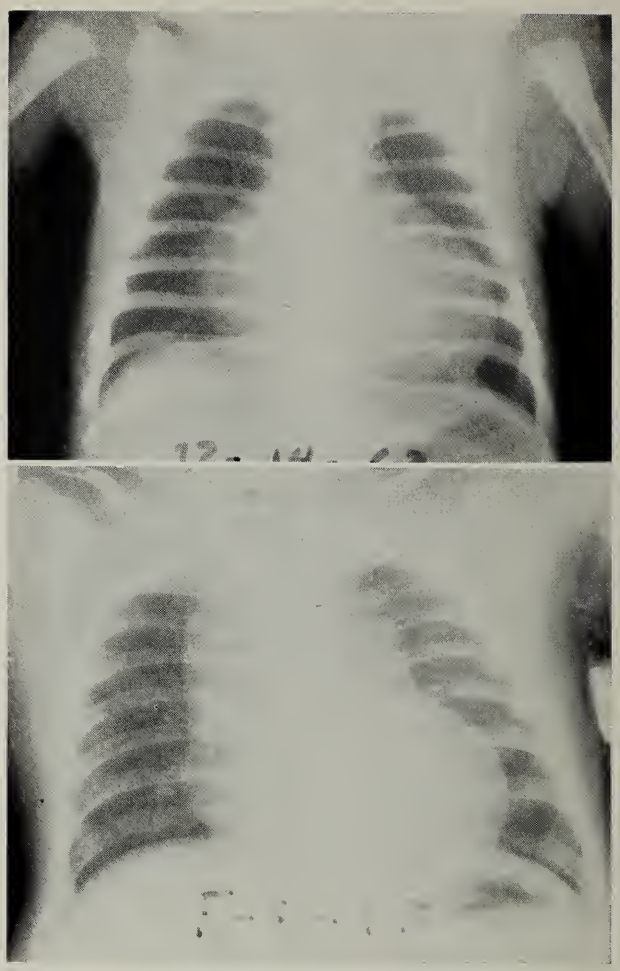


Figure 1.—Preoperative (above) and postoperative (below) roentgenograms of chest (posterior-anterior projection).

Report of a Case

A baby boy two days old was referred to the Sutter Memorial Hospital because of cyanosis, a heart murmur and cardiac enlargement. He was the second child born at term of a 24-year-old mother. The birth weight was 7 pounds 11 ounces. A roentgenogram of the chest taken on the first day of life revealed cardiac enlargement and pronounced pulmonary ischemia. An electrocardiogram had shown right ventricular hypertrophy, probably abnormal for age.

Body temperature was 96° F, the heart rate 120, the respiratory rate 20, blood pressure (flush) 50 mm of mercury in all limbs. There was moderate generalized cyanosis which increased with crying. Slight deformity of the left side of the chest was noted, and there was a thrustful cardiac impulse which was maximal at the xyphoid process. A slight systolic thrill was present at the second left intercostal space along the left sternal border. The first sound was of increased intensity and loudest at the apex. There was fixed splitting of the second sound

and diminished intensity of the second component. A systolic click at the mid left sternal border and a fourth sound at the lower left sternal border were heard. A grade 3 (of six grades) systolic ejection murmur was present at the left base and was well transmitted over the precordium and left posterior chest. There was no diastolic murmur. The liver edge was palpable 4 cm below the right costal margin, but was without pulsation. The peripheral pulses were diminished but were equal in the arms and legs. There was no edema or venous distention.

Hemoglobin was 19.9 gm per 100 ml. Leukocytes numbered 12,600 per cu mm with a normal differential of cells. Results of urinalysis were within normal limits. A roentgenogram of the chest (Figure 1) showed generalized cardiac enlargement and diminished pulmonary vascular markings. An electrocardiogram was interpreted as showing right axis deviation, right atrial hypertrophy and right ventricular hypertrophy, abnormal for age (Figure 2). A phonocardiogram confirmed the auscultatory findings (Figure 3).

It was felt that the most likely diagnosis was severe valvar pulmonary stenosis with an intact ventricular septum and a right-to-left shunt through a patent foramen ovale or a small atrial septal defect. The patient's color did not improve significantly with oxygen therapy. He was digitalized with Lanoxin.® On the fourth hospital day, cardiac catheterization and angiograms were performed. There was a 10 mm (mercury) right atrial "a" wave and a 1 mm mean gradient from the right to the left atrium. The right ventricular pressure was elevated to 140/0/10. The femoral arterial pressure was 90/65. The contour of the right ventricular pressure curve was of pyramid shape (Figure 4). Oxygen saturation of the blood in the femoral artery was 83.1 per cent. The right-to-left at the atrial level was computed to be 35 per cent of the systemic flow. The systemic cardiac index (calculated by the Fick method) was 2.3 liters per minute. Cineangiograms were performed with injections of 75 per cent Hypaque® into the inferior vena cava, the superior vena cava, the left atrial appendage and the right ventricle. A biplane Schonander angiogram was also performed following right ventricular injection of contrast material. The angiographic studies revealed right-to-left shunting of the contrast material across a small atrial defect or patent foramen ovale. The left atrium, left ventricle and aorta appeared normal. There was severe valvar pulmonary stenosis with a central valve opening which was computed to be 2 mm in diameter (approximately 6 per cent of normal for age). The right ventricular outflow tract was widely open during diastole but narrowed decidedly during systole (Figure 5).

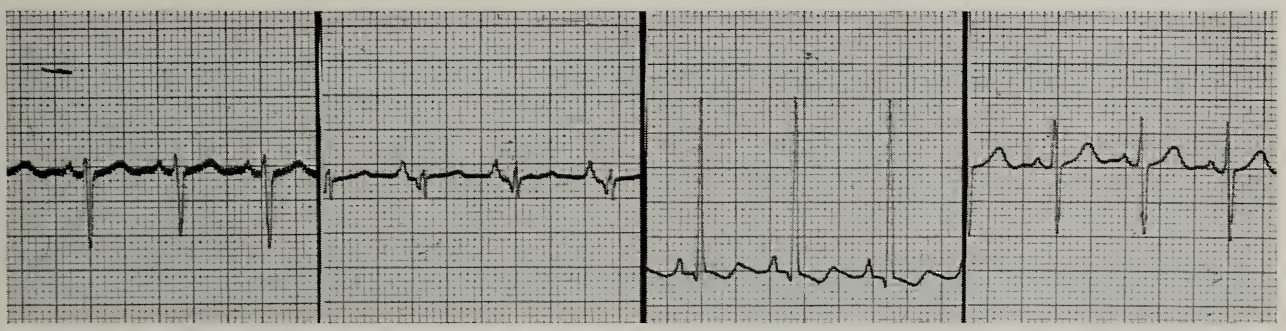


Figure 2.—Preoperative electrocardiograms. From left to right, leads 1, AVF, V_1 and V_6 are shown. Recorded at 25 mm per second.

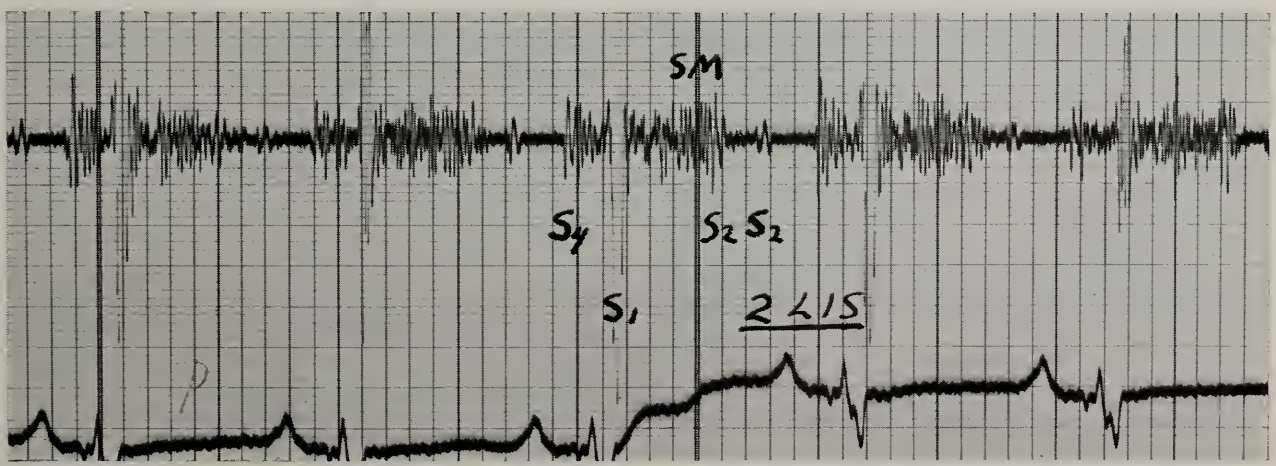


Figure 3.—Preoperative phonocardiographic findings recorded at the left base. Paper speed is 75 mm per second. The electrocardiogram (lead 2) is the reference tracing.

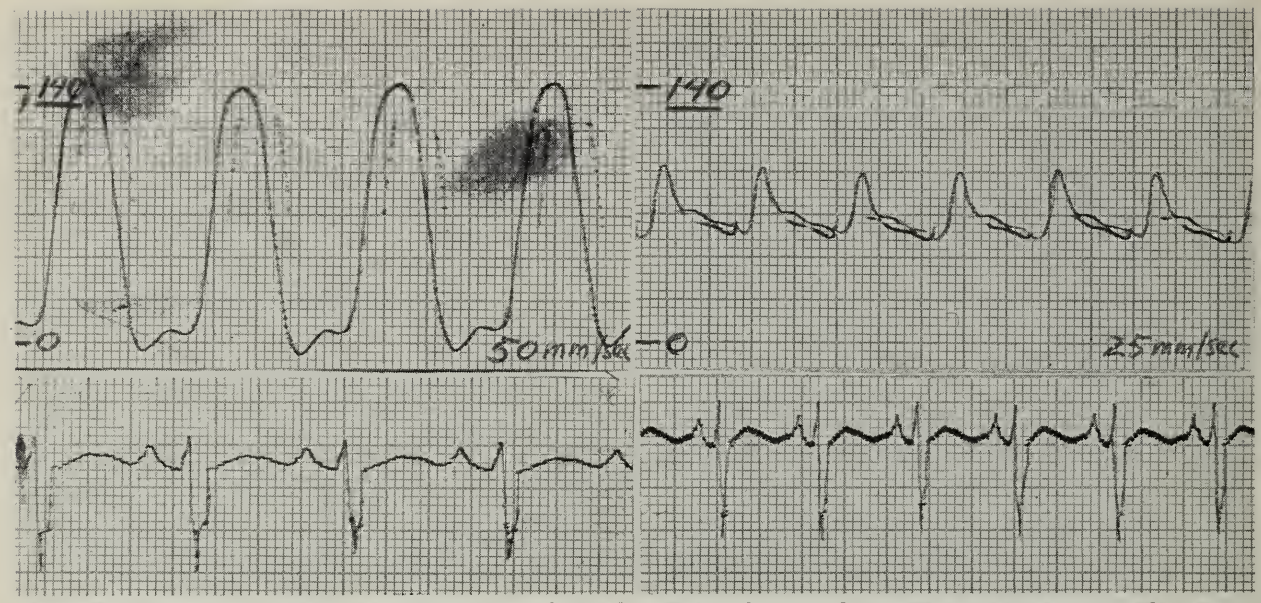


Figure 4.—Right ventricular (above, *left*) and femoral arterial (above, *right*) pressure tracings. The right ventricular systolic pressure of 140 mm of mercury was 50 mm higher than the femoral arterial systolic pressure. The lower frames are corresponding electrocardiograms.

As it appeared the baby would not survive without surgical correction of the right ventricular obstruction, open transarterial pulmonary valvotomy using hypothermia and inflow occlusion was carried out when he was six days old. The body temperature was lowered to 34° C, a longitudinal sternal splitting incision was made, and the superior and inferior vena cava were occluded. The pulmonary artery was opened and, with the aid of traction on the right ventricular outflow tract, a pulmonary valve orifice of 1 to 2 mm was visualized and the fused valve commissures were incised. Palpation revealed that the subvalvar obstruction was due to muscular hypertrophy and not to a fixed infundibular obstruction. The pulmonary artery was closed and the caval ligatures released. Total caval occlusion time was two and a half minutes. Total operation time was 100 minutes. The immediate postoperative right ventricular pressure was 20/0/5.

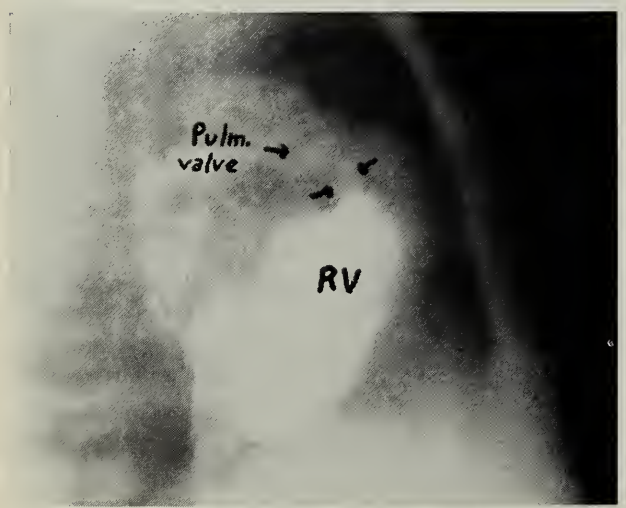


Figure 5.—Lateral angiogram following the injection of contrast material into the right ventricle. The ventricle is in the systole phase and the arrows delineate the pronounced obstruction of the subvalvar outflow tract. During diastole the outflow tract was not obstructed. The dome-shaped, thickened pulmonary valve is also demonstrated.

The postoperative course was uneventful. The baby's weight had been 7 pounds 7 ounces the day of operation. Three days later he began to gain approximately one ounce per day and at four weeks weighed 9 pounds, at seven weeks 12 pounds and at five months 19½ pounds. Digitalis was discontinued on the second postoperative day. Roentgenograms showed progressive decrease in the cardiac transverse diameter and increase in the pulmonary vascular markings (Figure 1). Electrocardiograms continued consistent with right ventricular hypertrophy. At the time of this report the patient was five and a half months old and was asymptomatic. A grade 3 systolic ejection murmur still could be heard at the left base.

Discussion

We believe that open heart correction using hypothermia and inflow occlusion is the best method for management of uncomplicated severe valvar pulmonary stenosis in neonates or small infants. We thought that in the present case the patient's "muscle bound" right ventricular outflow tract[5] might cause persistent right ventricular systolic hypertension of significant degree even after relief of the valvar stenosis.[3] In our experience, older patients who have had angiographic evidence of pronounced obstruction of right ventricular outflow during systole have

all required outflow patching for immediate relief of their right ventricular systolic hypertension. The pressure in the present case dropped to normal immediately following valvotomy. It is possible that the problem of persistent muscular obstruction following valvotomy is related to the duration of right ventricular overwork and consequently does not occur, or is not so frequent, in neonates and young infants.

The case presented also demonstrates the value of cineangiocardiography for the demonstration of stenotic lesions. The pulmonary valve orifice was clearly demonstrated on only two frames of the cineangiogram (60 frames per second). It is, therefore, not unexpected that the valve orifice was not outlined on the Schonander examination when films were taken at a speed of three per second. The size of the pulmonary valve orifice as we calculated it from the angiograms correlated well with the surgical findings. The assessment of the severity of stenotic lesions by the use of positive and negative contrast streams demonstrated cineangiographically will be the subject of a later report.

Summary

Severe valvar pulmonary stenosis in a six-day-old boy was successfully corrected by surgical operation using hypothermia and inflow occlusion. Right ventricular systolic hypertension was immediately relieved in spite of the patient's having a "muscle bound" right ventricular outflow tract.

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REFERENCES

1. Cayler, G. G., Taybi, H., Richardson, W. R., Williams, G. R., Campbell, B. S., and Tassopoulos, N.: The "new" approach to the management of congenital heart disease in infants, Am. Practitioner, 13:442, 1962.

2. Edwards, F. R.: Pulmonary valvotomy and infundibulectomy, Brit. Heart J., 22:422, 1960.

3. Johnson, A. M.: Impaired exercise response and other residuals of pulmonary stenosis after valvotomy, Brit. Heart J., 24:375, 1962.

4. McMahon, B., McKeown, T., and Record, R. G.: The incidence and life expectation of children with congenital heart disease, Brit. Heart J., 15:121, 1953.

5. Watson, H., Pickard, C., Lowe, K. G., and Hill, I. G. W.: Cineangiographic studies of the outflow tract in isolated pulmonary valvular stenosis, Brit. Heart J., 22:706, 1960.

Multiple Malignant Lesions With Long-Term Survival

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THE OCCURRENCE of more than one primary malignant growth in one person, while not common, has been reported many times in the medical literature. This is particularly true of primary growths involving multiple sites in a single organ such as the colon. However, the development of three distinct malignant lesions of unrelated cellular type in widely separated areas of the body, as happened in the case here reported, is decidedly unusual. The patient underwent three radical surgical resections of unrelated neoplasms within a period of 19 years. In addition, during this time he also had a severe fulminating episode of pneumococcal meningitis and had six basal cell growths removed from his face.

Report of a Case

Admission 1. A 36-year-old Air Force officer was admitted to an Air Force hospital in Amarillo, Texas, February 3, 1944, with a painful, swollen right testicle. In December, 1943, he had had a contusion of the right groin when he was accidentally kicked while playing volleyball. During the following week the scrotum increased in size on the right and became progressively more tender. The patient was treated as an outpatient for several weeks with cold packs and a scrotal suspensory. When the swelling did not subside and the pain became more intense, he was put in hospital. On admission the

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Submitted November 12, 1963.

right testicle was found to be decidedly enlarged and very firm. The left testicle was normal to palpation. On February 3, 1944, an exploration of the right scrotum was done with drainage of a testicular hematoma and biopsy of the right testis. The biopsy specimen was reported as embryonal cell carcinoma with secondary hematoma.

Right orchiectomy was performed February 25, 1944. The postoperative course was uneventful and the patient was transferred to Fitzsimmons Army Hospital on March 9, 1944, for deep radiation therapy. At that time the results of physical examination were within normal limits except for absence of the right testicle. An x-ray survey of the lung fields and bony structures revealed no evidence of tumor metastasis. The laboratory findings were normal except for a positive Aschheim-Zondek test reaction. Over the next 15 months the patient received three courses of deep x-ray therapy to the supraclavicular and abdominal lymph nodes, in March and in August of 1944 and in June, 1945. The patient continued to do well, with no evidence of metastasis, and a complete urological survey was within normal limits. He was finally returned to limited duty status on June 19, 1945. During an 18-year follow-up period there was no evidence of recurrence of testicular tumor.

Admission 2. In February, 1949, while stationed in Guam, the patient began to have spasms of pain starting in the mid-epigastrium and radiating into the throat. The attacks frequently awakened him at night and were relieved by taking baking soda. By early May, 1949, the patient was experiencing distinct midepigastric burning pain about an hour or two after meals and in the early hours of the morning. Ingestion of milk and antacids gave relief. On several occasions he noted an associated dull, constant pain in the midportion of his back. On May 26, 1949, he reported to a dispensary and was given tincture of belladonna. A gastrointestinal x-ray study was interpreted as normal. The symptoms persisted and the patient began to have episodes of nausea and acid eructation but no vomiting, hematemesis or melena. On June 15, 1949, an upper gastrointestinal x-ray study demonstrated a duodenal ulcer. An ulcer regimen was begun but when the symptoms did not improve after several weeks, the patient was sent to Letterman General Hospital, San Francisco, July 26, 1949. Physical examination there showed no abnormality except for the presence of several sharply demarcated areas of telangiectasis and increased pigmentation over the back, chest and abdomen resulting from the previous x-ray therapy. There was no lymphadenopathy, hepatosplenomegaly or evidence of abdominal masses. X-ray studies of the chest were normal and an extensive bone survey by x-ray showed no evidence of metastasis. Routine laboratory studies were within normal limits.

In the hospital the patient continued to have moderate to severe epigastric distress, relieved only partially with sedation and a strict Sippy regimen.

A second upper gastrointestinal x-ray study done two weeks after the patient entered the hospital revealed a filling defect in the lower third of the esophagus. Esophagoscopy with biopsy done August 30, 1949, revealed a squamous cell carcinoma of the lower portion of the esophagus. On September 6, 1949, the distal third of the esophagus and the proximal portion of the stomach were resected and anastomosis of the esophagus and the stomach was done.

The patient withstood the procedure well and his convalescence was completely uneventful. Weekly dilatations of the esophagus were carried out over the next 13 weeks. Eventually he was able to eat a regular diet. Except for mild symptoms of reflux esophagitis, which were effectively relieved by antacids, he had no residual esophageal symptoms. He was discharged from the military service for physical disability in April, 1950. In the ensuing 14 years the patient did well except for recurrent bouts of peptic esophagitis complicated on two occasions by episodes of hematemesis requiring blood transfusions.

Admission 3. The patient was admitted to Letterman General Hospital December 1, 1959, with diagnosis of acute meningitis. Three days previously symptoms of an acute upper respiratory tract infection had developed.

One day before admission he was seen as an outpatient with a temperature of 104° F. The physical examination and x-ray study revealed no abnormal pulmonary findings. The patient was given tetracycline (Achromycin®), an aspirin compound and pentobarbital and was sent home. His symptoms worsened as the day wore on. He took only one tablet of Achromycin. That night he retired early, complaining of a severe headache. During the night his son heard him cursing and mumbling incoherently in his sleep. The boy thought his father was having a nightmare and did not go to his room. The following morning the patient was stuporous and irrational. His son had him moved to the hospital by ambulance.

On admission he was semi-comatose, responding to pain or movement of his extremities but not to vocal commands. He had irrational outbursts of cursing and incoherent speech. The blood pressure was 130/85 mm of mercury, the pulse rate 90 and regular, respirations 24 per minute and rectal temperature 104° F. The pupils reacted well to light but it was difficult to visualize the fundi. There was

questionable blurring of the optic disc on the left. The patient's oropharynx could not be examined because he held his jaws tightly clenched. The tympanic membranes were intact and there was no evidence of purulent drainage from either ear. The trachea was free of secretions and there was no evidence of respiratory difficulty.

Examination of the heart revealed only a Grade I apical systolic murmur. No abnormalities were noted on examination of the abdomen. There were no areas of spasm or tenderness and there was no organomegaly. Signs of meningeal irritation were present—rigidity of the neck muscles, retraction of the head, opisthotonos and a positive Kernig sign. There were no localized neurological findings. A blanching macular eruption was noted over the abdomen and thighs but no petechiae were seen.

Laboratory Data: Urinalysis showed specific gravity of 1.032 and albumin three plus; on microscopic examination, 15 to 20 erythrocytes and 4 to 8 leukocytes per high power field. There were numerous coarse granular casts. Leukocytes numbered 21,650 per cu mm of blood, with 91 per cent neutrophils and 8 per cent lymphocytes. The sedimentation rate (Wintrobe) was 30 mm in one hour.

Spinal puncture was carried out. The opening pressure was 600 mm of water and the closing pressure 365 mm. The fluid was cloudy. It contained 36 mg of sugar and total protein of 588 mg per 100 ml. There were 2050 leukocytes per cu ml—95 per cent neutrophils and 5 per cent lymphocytes. Gram staining revealed Gram-positive diplococci. A culture grew diplococcus pneumoniae which were sensitive to penicillin, oxytetracycline and chloramphenicol. Blood urea nitrogen was 21 mg per 100 ml, glucose content 179 mg per 100 ml (taken while intravenous glucose was administered), sodium 134 mEq per liter, potassium 4.6 mEq per liter, carbon dioxide 20.8 mEq per liter and chlorides 103 mEq per liter.

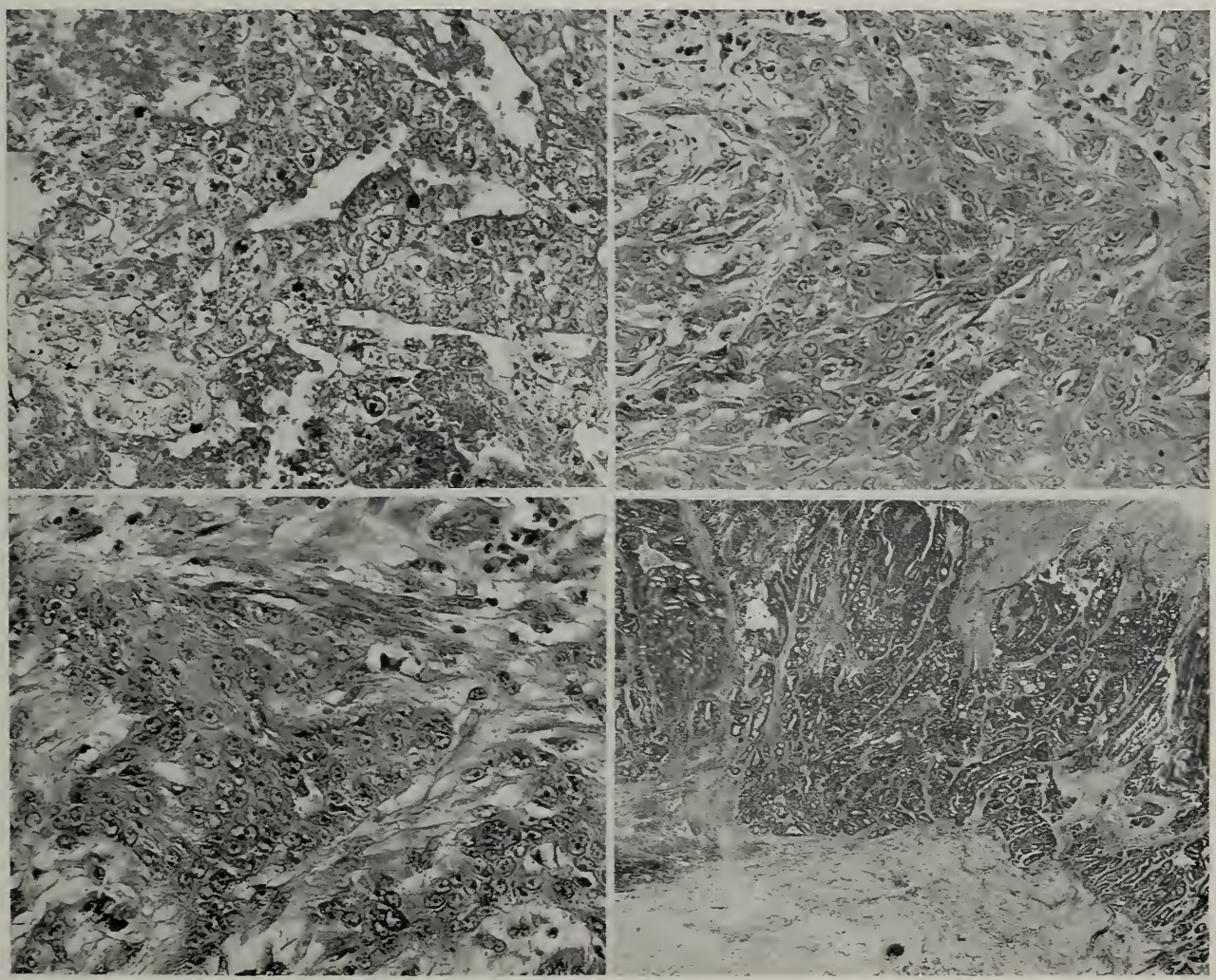


Figure 1.—*Upper left,* embryonal carcinoma in section of left testis removed in 1944. *Upper right,* squamous cell carcinoma replacing mucosa in specimen of esophagus resected in 1949. *Lower left,* metastatic squamous cell carcinoma in paraesophageal lymph node removed at time of removal of primary tumor from esophagus. *Lower right,* moderately well differentiated carcinoma (removed in 1962) replacing the colonic mucosa, invading the muscularis and extending almost to the mesenteric adipose tissue.

Intravenous infusions of aqueous penicillin were begun, 1,000,000 units every two hours in 5 per cent dextrose in water.

Because of his extreme combativeness, restraints were required. Oxygen was given by nasal catheter. On auscultation rales were heard in the right lung base and an x-ray film showed pneumonitis in this area. The patient showed gradual improvement. By December 5 he was afebrile, had no more headaches, was eating well, and was completely rational. On December 7 the aqueous penicillin was discontinued and was replaced by oral administration of 1,300,000 units of procaine penicillin given twice daily. On December 10 penicillin was discontinued. The patient was discharged from the hospital on December 13, 1958, and on follow-up examination he continued to do well and had no residual effects from his disease. The final diagnosis on this patient was acute meningitis due to diplococcus pneumoniae.

Admission 4. The patient, who had been well in the meantime, entered the hospital May 24, 1960, for repair of a hydrocele of the tunica vaginalis and recovered from this surgical procedure without incident.

Admission 5. On January 10, 1962, generalized malaise developed, with headache, pain in the chest and a cough productive of yellowish sputum. The patient was put in hospital January 24, 1962, when these symptoms worsened and an x-ray film of the chest showed a pneumonic process in the left lower lung field. The body temperature was 101° F, the pulse rate 80 per minute and the blood pressure 140/80 mm of mercury. The conjunctivae were pale and the vessels of the pharynx engorged. On examination of the lungs dullness at the left base, moist rales and decreased breath sounds were noted.

Laboratory Data: Erythrocytes numbered 3.05 million per cu mm and the hemoglobin content was 6.7 gm per 100 ml. The hematocrit was 25 per cent, mean corpuscular volume 82 per cent, acetyl-beta-methyl choline hydrolyzing enzyme 21.5 per cent, mean corpuscular hemoglobin concentration 26 per cent and reticulocyte count 2.4 per cent. Leukocytes numbered 18,400 per cu mm—78 per cent neutrophils, 12 per cent lymphocytes, 9 per cent monocytes and 1 per cent basophils. Serum iron was 30 micrograms per 100 ml. Total iron-binding capacity was not determined. Results of urinalysis were within normal limits. Several stool specimens gave three to four plus reaction to a guaiac test. Cultures of specimens from the nose, throat, sputum, urine and feces were all negative for pathogenic organisms. An electrocardiogram showed a complete left bundle branch block which was known to have been present since May, 1960. X-ray films of the chest confirmed the previously noted pneumonic process of the left lower lung field.

On general supportive care and tetracycline therapy the patient recovered from the pneumonic process rapidly. However, the cause of anemia was still not explained. Ever since the esophageal resection for malignant disease in 1949 the patient had had considerable difficulty with reflux esophagitis and it was thought that the anemia might be due to chronic blood loss from this condition. Upper gastrointestinal and small bowel x-ray studies were negative except for some narrowing at the esophagogastric anastomotic site. A barium enema study, however, revealed a filling defect in the distal transverse colon which was interpreted as a malignant lesion.

A resection of the transverse colon and anastomosis of the ascending and descending colon were carried out. The resected growth proved to be a moderately well-differentiated, fungating and ulcerated adenocarcinoma arising from the colonic mucosa and extending to the serosal surface in an annular fashion. There was no evidence of malignant spread to the regional lymph nodes, peritoneal surfaces or liver. The patient's convalescence following operation was uneventful and he was discharged from the hospital March 9, 1962. He continued to do well during the next 18 months to the time of this report.

ADDENDUM: Over the past six years, the patient has had six basal cell carcinomas removed locally from the skin of his face.

Discussion

The fortuitous discovery of testicular neoplasm following trauma to the testis is not unique. Other cases have been reported of the chance finding of a malignant growth at the time of surgical drainage of a hematocele or hematoma in the testicle injured during participation in sports. In a recent study, reported from Walter Reed General Hospital, of 389 patients with testicular malignant lesions of all types, the five-year survival rate after all modes of therapy was 61.4 per cent. For the 125 patients in the group with embryonal carcinomas it was 44 per cent.[23,24] Among 59 patients reported by Staubitz and colleagues, 39 per cent of those with embryonal carcinomas survived five years after orchiectomy and retroperitoneal lymph node resection.[27] In a group of 115 patients reported upon by Grabstalt and coworkers, 40 had embryonal carcinomas and seven who had such lesions were still living six to nine years after operation.[8] At Walter Reed General Hospital the treatment for embryonal growths without clinical evidence of metastasis is orchiectomy followed by bilateral abdominal lymphadenectomy performed through a transperitoneal approach. If the lymph nodes removed are free of tumor, no further

treatment is given. If the nodes show tumor, postoperative irradiation is given to the entire lymphatic chain, including the supraclavicular, mediastinal and abdominal nodes. Most authorities agree that lymph node dissection should be done routinely for embryonal carcinomas and teratocarcinomas.[13,27,28] The patient in the present case had only simple orchiectomy without abdominal exploration, so it is not known whether or not the abdominal lymph nodes were involved. Some embryonal carcinomas are radiosensitive, others not. In the present case the result of an Aschheim-Zondek test was positive, which is generally considered to be a poor prognostic sign and may have indicated abdominal lymphatic spread. Therefore, the three courses of irradiation he received following orchiectomy may very well have contributed to his long survival—19 years at the time of this report.

Patients with carcinoma of the esophagus have a notoriously poor survival rate. In most large series of cases reported in the literature, only 3 to 5 per cent are alive five years after the diagnosis is made.[16,17,18,22] Watson and Goodner had only 12 five-year survivals in 1,250 cases. These included three of 77 patients treated by operation alone (4 per cent), six of 929 treated by irradiation alone (0.65 per cent), and three of 39 treated with a combination of surgical operation and irradiation (7.7 per cent).[31] Of 299 untreated patients reported by Greenwood in 1926, 25 per cent were dead within six months of diagnosis, 50 per cent within eight months and 75 per cent within one year.[10] Carey had only five five-year survivals in 475 patients with lesions of the lower esophagus and cardia.[3] Squamous cell carcinomas involving the esophagogastric junction are associated with the best prognosis. Sweet reported 17 per cent five-year survivals after resection of lesions in this region as compared with 4 per cent five-year survivals associated with growths in the midesophagus.[29,30] Of the 405 patients reported by Miller with growths involving the thoracic esophagus and cardia, only 108 left the hospital alive following resection of an operable tumor. Of this group, 22 survived five years or more; and in 17 of the survivors the lesion was in the lower esophagus and cardia.[15]

In Ellis' series of 909 patients reported from the Mayo Clinic the overall five-year survival rate was 3.9 per cent and the five-year survival rate for squamous cell lesions of the lower esophagus was 12 per cent. In this group the lesions were operable in 45.6 per cent of cases, and 26 per cent of the patients survived resection.[5] In another large series, 953 patients with esophageal neoplasms reported from Japan by Nakayama,[17] there was a 12.2 per cent survival rate after a left intrathoracic esophagogastrostomy.

From the above studies it can be seen that the overall prognosis in carcinoma of the esophagus is still bleak regardless of the treatment given. Despite this poor salvage rate, surgical resection is still the treatment of choice for these tumors. While radiation gives remarkable palliation in some patients, it produces very few cures. The patient in the present case, who had a squamous cell tumor of the lower third of the esophagus, has survived 14 years since resection and esophagogastrostomy despite the fact that pathological studies showed definite lymph node involvement at the time of operation.

The discovery of the colonic malignant lesion was also fortuitous. Although the patient had no abdominal distress or change in bowel habits he did have an unexplained iron-deficiency anemia and the stools were strongly reactive to the guaiac test. This led to his having a barium enema and the chance discovery of the bowel neoplasm.

The overall five-year survival rate following "curative" resection for carcinoma of the colon has changed very little in the past few decades.[2,4,12,20] In 1941 Mayo and Lovelace reported it to be 57 per cent at the Mayo Clinic.[14] In 1,667 patients reported by Grinnell in 1953, the five-year survival rate was 59.5 per cent for lesions in the ascending colon, 25 per cent for those in the hepatic flexure, 52.3 per cent for the transverse colon and 55 per cent for lesions in the left colon.[11] Gilbertsen reported a 52 per cent five-year survival rate in 798 patients with colonic malignant lesions resected for cure from 1940 through 1954.[7] Patients with lesions causing complete obstruction have a much poorer prognosis than those with nonobstructive growths. Gregg reported a 35 per cent five-year survival rate for patients with complete obstruction and a 54 per cent rate for those with partial obstruction.[9] Wilder and Dockerty in 1961 found a 22 per cent five-year survival rate for patients with obstructive growths in the hepatic flexure and a 33 per cent rate for those with obstructive growths of the ascending colon.[32] In a recent report of 1,972 patients with malignant disease of the colon reported by Bacon, 1,716 had resectable growths. Those whose lesions involved the descending colon had a five-year survival rate of 66.6 per cent and a ten-year survival rate of 52.1 per cent.[2] It is seen, therefore, that colonic neoplasms are among the most curable in the body. In the present case the lesion extended in an annular fashion around the intestinal wall to involve all but 1.5 cm of the circumference. The surrounding colonic fat appeared to be involved. Microscopic sections of the lymph nodes present in the resected surgical specimen showed no evidence of metastatic spread.

Patients with pneumococcal meningitis rarely recovered before the advent of sulfonamide therapy

and even after sulfonamides were introduced the mortality was still 60 to 80 per cent.[1] At present, with appropriate penicillin therapy, recovery can be expected in 70 to 85 per cent of patients.[25,26] In a recent report by Spink of 55 patients with bacteriologically proven pneumococcal meningitis the overall mortality was 25 per cent. Patients over 40 years of age had a mortality rate exceeding 50 per cent. The duration of illness before therapy was begun was very definitely related to the outcome. Patients who were ill for three days or more before the institution of therapy and those admitted in coma had the poorest prognosis. Twenty-one per cent of the patients had sequelae consisting of hydrocephalus or cranial nerve involvement with visual and auditory deterioration. Otitis media, the most common primary focus of infection, occurred in 18 of the 55 patients. Pneumonia was found in only four patients.[26] In a recent study of 43 patients with pneumococcal meningitis seen at a large city hospital by Olsson, Kirby and Romansky, the overall mortality rate was 65 per cent. Delay in starting treatment was the primary reason for the high mortality rate, which reached 80 per cent for patients who were ill three days or more before treatment was begun. When illnesses such as otitis media and pneumonia were present concurrently, the mortality was decidedly higher. Patients admitted in coma had a mortality rate of 77 per cent while those who were stuporous or semicomatose had mortality rates of 59 and 55 per cent respectively. Bacteremia was associated with a fatality rate of 68 per cent. The meningitis was secondary to pneumonia in 17 of these patients and to otitis media in eight cases.[21] The importance of age on the prognosis of patients with pneumococcal meningitis is borne out in the study of Nemir and Israel, who reported a 93 per cent recovery rate in a series of 15 infants and children treated with a combination of penicillin and sulfonamide.[19] By contrast, Feibush reported only 32 per cent recoveries in older patients with pneumococcal meningitis who were treated with the same agents.[6] The patient in the present case was fortunate in having treatment started within 18 hours of the development of the first meningeal symptoms, thanks to his son's alertness in getting him to a hospital. Unfavorable factors present in his case were that the patient was 51 years of age, had a pneumonic process in his right lung base and was semicomatose and irrational on admission.

Summary

The patient in the case here reported, a 54-year-old man, is still living and well (January, 1964) despite the fact that he underwent orchiectomy for removal of an embryonal carcinoma of the right testis in 1944, resection and esophagogastrostomy for a squamous cell carcinoma of the lower esophagus in 1949, and resection of the transverse colon and a portion of the ascending and descending colon for an adenocarcinoma of the splenic flexure in February, 1962. In addition, he weathered an attack of fulminating pneumococcal meningitis in 1959. He has also had six basal cell malignant lesions removed from his face over a six-year period.

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REFERENCES

1. Austrian, R.: Prevalence of pneumococcal types and continuing importance of pneumococcal infections, Am. J. Med. Sci., 2381:133, Aug., 1959.

2. Bacon, H.: Major surgery of the colon and rectum, rehabilitation and survival rate in 2457 patients, Dis Col. Rec., Sept-Oct., 1960.

3. Carey, J. M., and Clagett, O. T.: Carcinoma of the lower portion of the esophagus and cardia of the stomach, Ann. Surg., 142:2-5, 1955.

4. Cole, W. H., Economu, S., and Hunter, J.: Carcinoma of the colon, Surg. Clin. No. Am., 42:519, Apr., 1962.

5. Ellis, F. H., Jackson, R. C., Krueger, J. T., Jr., Moersch, H. J., Clagett, O. T., and Gage, R. P.: Carcinoma of the esophagus and cardia: Result of treatment, 1946-1956, New Eng. J. Med., 260:351, 1959.

6. Feibush, J. S., Murphy, E. J., and Lubart, A.: Pneumococcal meningitis in adults, Ann. Int. Med., 37:65, 1952.

7. Gilbertsen, V. A.: Results of treatment of bowel cancer, Ann. Surg. 157:198, Feb. 1963.

8. Grabstalt, H., Rhamy, A. P., and Dryden, C. B., Jr.: Tumors of the testis: A study of 115 cases, So. Med. J., 50:1347, Nov., 1957.

9. Gregg, R. O., Chamberlain, B. E., and Vercillo, H. S.: Carcinoma of the colon and rectum, J.A.M.A., 170:143, 1959.

10. Greenwood, M.: Natural duration of cancer. *British Ministry of Health.* Reports on Public Health and Medical Subjects. No. 33, London, 1926, His Majesty's Stat. Off.

11. Grinnell, R. S.: Results in the treatment of carcinoma of the colon and rectum. An analysis of 2341 cases over a 35-year period with five year survival results in 1667 patients., Surg. Gynec. Obst., 96:31, 1953.

12. Lahey, F. H., and Sanderson, E.: Lesions of the right colon involving a right colectomy, J.A.M.A., 120:1356, 1942.

13. Leadbetter, W. F.: Diagnosis and treatment of tumors of the testes, Am. J. Surg., 95:341, Mar., 1958.

14. Mayo, C. W., and Lovelace, W. R.: Malignant lesions of the cecum and ascending colon, Surg. Gynec. Obst., 72:689, 1941.

15. Miller, C.: Carcinoma of the thoracic esophagus and cardia. A review of 405 cases, Brit. J. Surg., 49:507, Mar., 1962.

16. Morrison, D. R.: Treatment of carcinoma of the esophagus. A comparison of surgery and x-ray, Surgery, 46:516, 1959.

17. Nakayama, K.: Statistical review of 5-year survivals after surgery for carcinoma of the esophagus and cardiac portion of the stomach, Surgery, 45:883, June, 1959.

18. Neilsen, J.: Clinical results with rotation therapy in cancer of the esophagus, Acta. Radiol., 26:361, 1945.

19. Nemir, R. L., and Israel, J.: Pneumococcic meningitis in infants and children. Combined therapy using penicillin and sulfonamides, J.A.M.A., 147:213, 1951.

20. Nickell, D. F., and Dockerty, M. D.: The five year survival rate in cases of completely obstructing carcinoma of the descending colon and sigmoid., Surg. Gynec. Obst. 87:519, 1948.

21. Olsson, R. A., Kirby, J. C., and Romansky, M. J.: Pneumococcal meningitis in the adult., Ann. Int. Med., 55:545, Oct., 1961.

22. Ottosen, P., Behrendt, F., and Sondergaard, T.: Treatment of carcinoma of the esophagus and cardia. Description of a new operative technique, Acta. Chir. Scand. 117:181, 1959.

23. Patton, J. F., Hewitt, C. B., and Mallis, N.: Tumors of the testis, J. Urol., 81:457, Mar., 1958.

24. Patton, J. F., Hewitt, C. B., and Mallis, N.: Diagnosis and treatment of tumors of the testis, J.A.M.A., 171:2191, Dec. 19, 1959.

25. Ribble, J. C., and Braude, A. I.: ACTH and adrenal steroids in the treatment of pneumococcal meningitis in adults, Am. J. Med., 24:68, Jan., 1958.

26. Spink, W. W., and Su, C. K.: Persistent menace of pneumococcal meningitis, J.A.M.A. 173:1545, Aug 6, 1960.

27. Staubitz, W. J., Magoss, I. V., Oberkircher, O. J., Lent, M. H., Mitchell, F. D., and Murphy, W. T.: Management of testicular tumors, J.A.M.A., 166:751, Feb. 15, 1958.

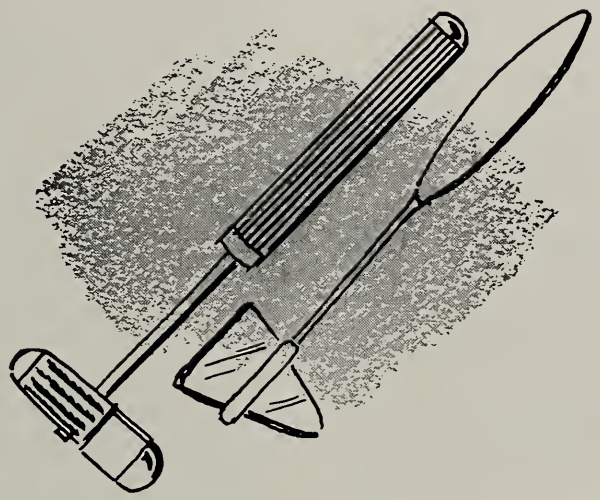
28. Stephen, R. A.: Malignant testicular tumors, Ann. Roy. Coll. Surg. Eng. 23:71, Aug. 1958.

29. Sweet, R. H.: The results of radical surgical extirpation in the treatment of carcinoma of the esophagus and cardia, Surg. Gynec. Obst., 94:46, 1952.

30. Sweet, R. H.: Late results of surgical treatment of carcinoma of the esophagus., J.A.M.A., 155:422, 1954.

31. Watson, W. L., Goodner, J. T.: Carcinoma of the esophagus, Am. J. Surg. 93:259, Feb., 1957.

32. Wilder, T. C., Dockerty, M. B., and Waugh, J. M.: A clinical pathological study of obstructing carcinoma of the right portion of the colon, Surg. Gynec Obst., 113:353, 1961 (Sept).



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EDITORIAL

Hospital Staff Privileges

THE GROWING IMPORTANCE of hospitals as an essential element in much of modern day medical practice has made it necessary for the medical profession to develop ways for formal appraisal of hospitals and the competence of the medical staffs.

One of the steps taken in this direction some time ago is the *Guiding Principles for Physician-Hospital Relationships* which were agreed to by the California Medical Association and the California Hospital Association in 1960. Another is the recent action by the California Medical Association Council endorsing the principle of creating councils within hospital staffs for review of appeals by physicians whose staff privileges may have been curtailed or otherwise altered.

Court decisions in the past few years in cases involving the admissibility of a physician to a hospital staff, or the physician's failure to secure reappointment to a hospital staff have caused many hospitals and physicians, as well as attorneys, to review the questions involved.

Behind what appears to be a major change in judicial thinking is the evolution of the hospital from simply a hotel for sick people to a quasi-public institution operated for the benefit of the community—a place of special care where physicians may have access to costly equipment and to personnel skilled in using it.

The very fact that the hospital often is the only practical place for much of the care and treatment made possible by recent great advances in medicine has given the public a feeling of proprietary interest in hospitals. Further adding to this attitude is the availability of hospital construction funds from public agencies. Even strictly private hospitals that have never sought public moneys but that have enjoyed tax advantages as non-profit charitable institutions for certain purposes may be considered quasi public in character because of the publicly granted tax advantage.

On this foundation the courts of our state have based several recent decisions involving district hospitals which have startled many physicians and many hospital administrators and board members. One such decision held that a physician may not be denied staff membership by the district board of directors simply because he does not carry malpractice insurance. In another case the court ruled against a hospital which had revoked a physician's staff membership on grounds that he was temperamentally unsuited to staff discipline. In still another case a judge ruled that a physician's past record was not to be used solely in judging his qualifications for staff membership at this time.

Despite these court decisions and others which might be mentioned, the courts have not been unaware of the desire of hospitals and their medical staffs to do their own policing job. Tissue and review committees in hospitals, designed to assure high standards of practice, have been recognized by the courts as effective and necessary. Such committees have even been granted a degree of immunity from civil actions where they are operating in the interest of good practice and for the benefit of the patients. This grant has come through legislative action but is bound to be recognized by the courts in the event of litigation.

The organization of hospitals staffs under bylaws is well recognized in our courts as essential machinery. Judicial censure is invoked, however, where staff bylaws permit or are interpreted to mean that a physician may be barred from staff membership or have his staff privileges curtailed for reasons that in the eyes of the court might be considered arbitrary or capricious. Staff privileges, the courts find, must be based in professional competence, observance of ethical standards and personal character. It is in such matters that the reviews by tissue committees and by other boards of appraisal within a

hospital can be most helpful—first in self-regulation, but also as evidence in event of litigation.

The California Medical Association took action some years ago to see that hospital bylaws did not make medical society membership a prerequisite to admission to a hospital staff. This eliminates possible conspiracy charges and places staff admission solely on a basis of proven professional competence, licensure and ethical behavior.

Fortunately, in California close liaison exists between the medical and the hospital associations. Both organizations have extremely competent legal counsel and we may be assured that hospitals, their administrators and their staff and board members will be well advised on legal intricacies. They will learn also to live with some court decisions which at the moment appear to impose considerable obstacles to the smooth running of our hospitals.

We will all probably be well advised to consider the tenor of some of our court decisions today as milestones on the path of change and to adjust ourselves to modern conditions that may appear to lean backwards in guaranteeing freedom to all individuals in the care of the sick.

AMA Meeting Results

CALIFORNIA FARED EXTREMELY WELL in the 113th Annual Session of the American Medical Association, held in San Francisco the last week of June.

Several resolutions introduced by the California delegation into the House of Delegates were approved, accepted in principle or combined with similar resolutions into concrete actions.

In addition, two California physicians were honored by election to important AMA Councils. Doctor William P. Longmire of Los Angeles won election to the Council on Medical Education and Doctor John Rumsey of San Diego to the Council on Medical Service. These were the only California nominees for election by the House of Delegates and their success is a tribute to the standing of the state in the policy-making body of the national organization.

California delegates entered a number of resolutions into the House of Delegates, where all fared well. One of these, calling for a clear statement on the availability of medical care, was approved with minor modifications; and another, proposing added study on the use of the prepayment principle during working years to provide after-retirement health care benefits, was favorably received and referred to the AMA Committee on Insurance and Prepayment for further study and report. This proposal has already received official sanction in California and pilot programs are in preparation between the CMA and CPS.

Two additional California proposals dealing with the health hazards of smoking and the public position of the AMA in this matter were combined with several resolutions from other states into a statement which commends the Surgeon General for his studies, calls for clarification of the research activities of the AMA in the field of smoking and gives the national organization a stronger attitude on the dangers of smoking than had prevailed earlier.

Probably the most newsworthy California proposal was a resolution in the field of human rights, calling for an all-out effort to assure that medical society membership and privileges be based on professional competence and not on questions involving, race, color, religion or other social factors. Here again, other state associations entered resolutions to accomplish similar purposes and all were combined into a single declaration which showed the House of Delegates as "unalterably opposed to the denial of membership, privileges and responsibilities to any duly licensed physician because of race, color, religion, ethnic affiliation or national origin." The statement also called upon "all state medical associations, all component societies and all individual members of the AMA to exert every effort to end every instance in which such equal rights, privileges and responsbilities are denied."

Other California resolutions on subjects ranging from health career recruitment to prescription labeling and improved prenatal facilities for unwed mothers met approval and were forwarded to appropriate councils and committees for study or implementation.

California physicians may well be proud of their accomplishments at this annual AMA meeting. Their philosophies and proposals for action, even in controversial fields, all met with official approval and two of their own members were elected to high posts in the largest medical organization in the world.

As host state California also shone. Weather was excellent, facilities fine and a return invitation for 1968 has been accepted, with San Francisco again the host city.

New Habiliment

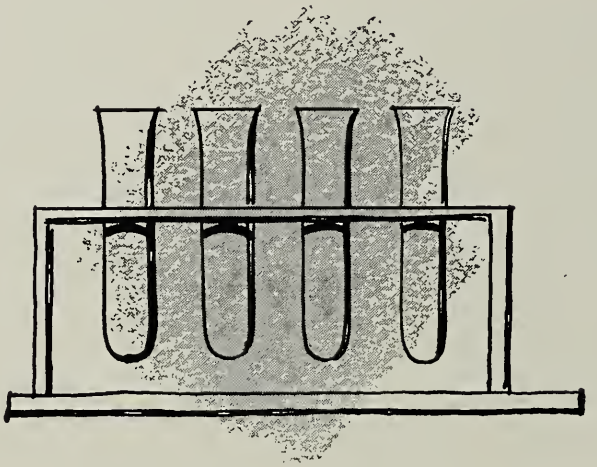
With this issue California Medicine dons a new jacket and makes some changes in inside dress. Partly this was done because eighteen years in the same garb is just too long, partly because we felt we were getting a little stale and a little out of style in matters of dress and partly to make better use of white space.

The new cover design, besides printing our name in a stand-up type face of a kind now in fashion, gives us more room for the table of contents. We had been looking a little cluttered there, we thought, so we eliminated California's shoreline and went to sea.

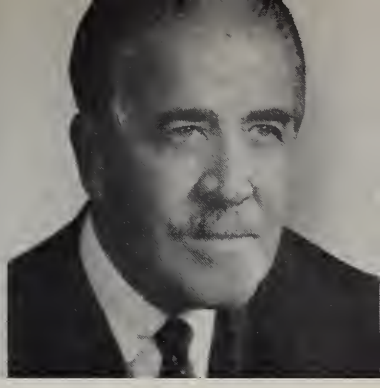
Inside, although sticking to one style of type for all, we have dressed up articles by varying the size of type and the placement of it to suit the length of the title and the space. These variations are done within a standard order of presentation—the title, the author's name, the summary and then the body of the article.

The changes in dress were undertaken following recommendations by the Committee on California Medicine of the Scientific Board last spring. Other recommendations—for use of a better grade of paper and a somewhat more open type face for the body of the articles in your journal—which would entail a considerable increase in annual expenditure, have been put before the Budget Committee for consideration in next year's allotments. Meanwhile we are using our standard quality of paper, and for the body of the printed matter we are continuing with the type that we have used for a number of years—Bodoni Book is its name.

The changes you see have not been very costly in money. We hope you like them.



The President's Page



A UNIQUE PARTNERSHIP

In an atmosphere of cooperation and mutual respect, a unique partnership has emerged in the state between the California Hospital Association and the California Medical Association. During the first months of my presidency, I have been impressed with the desire of the officers and staff of the hospital association to work with CMA for the benefit of hospitals and physicians and of the patients that both are dedicated to serve.

This working relationship between medical association and hospital association is unique in the nation and California medicine should be proud that the liaison exists. Realizing the complexity of modern medical and hospital practice, we must continue our joint efforts to solve problems with which both organizations are vitally concerned.

In January of this year, the California Hospital Association offered forceful testimony against financing health care for the aged through Social Security before the Ways and Means Committee of the United States House of Representatives. Clifton Linville, CHA president, appeared before the committee; his testimony preceded by one day CMA testimony given by Doctor Samuel Sherman.

I was particularly pleased to review recently the testimony given on that occasion by the CHA. In one passage Mr. Linville said: "In rejecting the fundamental premises of compulsory health insurance for the aged under the proposed King-Anderson approach, the membership of the California Hospital Association bases its decision on careful thought and study of similar proposals made in California for more than 20 years. The California Hospital Association has constantly opposed such proposals as not being in the best interests of the community and of the patients it serves in its member hospitals."

Mr. Linville further stated: "Our brief experience with Kerr-Mills convinces us it can be an effective mechanism to close one of the last remaining gaps in the financing of health care for all Americans. And because it is responsive to local control, it will be self-limiting. Also, we believe that the continued agitation for the King-Anderson approach has caused California's state administration and legislature to procrastinate on effective implementation of Kerr-Mills."

On the public platform as well, CHA officers have carried their full share of the load in presenting to the people of California some of the socio-economic problems of health care in the sixties. They have delivered over a hundred speeches in various parts of the state—to service clubs, community organizations, county societies and women's groups. In many instances media coverage has been excellent.

The California Hospital Association has been most helpful in publicizing to its member hospitals the Guiding Principles for Physician-Hospital Relationships. And when requested by CMA, the hospital association has freely publicized the importance of the CMA medical staff voluntary survey program.

Because we believe that a continual exchange of views between the two associations is most desirable, we have invited the CHA president to the regular meetings of our CMA Council. Likewise, I have represented the CMA before the Board of Trustees of the hospital association.

At the last CHA board meeting in Carmel I had an opportunity to discuss with the leadership those resolutions from our 1964 annual session which apply to hospitals. The CMA report on the future role of county hospitals in California was of significant interest to the board members.

In the ways I have cited, and in many others, the California Medical Association and California Hospital Association have a unique partnership—of knowledge, discussion, understanding and action.

I am aware of the excellent relationship existing between county societies and local hospitals in many areas of our state. I urge the profession to be cognizant of the necessity of improving this relationship in each local situation. Only in this way can exchanges of viewpoint and programs for action on the state level be effective and meaningful.

Of course, problems remain. I am personally convinced, however, that united efforts in selected areas of concern are beneficial and necessary to medicine, to hospitals, and to 17 million Californians.

James C. Doyle

California Medical Association

NOTICES AND REPORTS

California Physician Fee Index, June 1962 and December 1963

A Report of the Bureau of Research and Planning, California Medical Association

MOST RECENT available figures from the California Physician Fee Index indicate that the general level of physicians' fees for services throughout the state has risen almost six per cent in the eighteen-month period between June, 1962 and December, 1963. This averages slightly less than one per cent per quarter. The Index as of the close of last year was 105.8, with the June, 1962 base period equal to 100.0.

During the comparable period the Physician Fee Index rose three per cent nationally. It should be noted that the national figures, calculated by the Bureau of Labor Statistics of the United States Department of Labor, are based on a compilation of fees for five procedures (three surgical, two medical), whereas the California Index, compiled by the Bureau of Research and Planning of the California Medical Association, is based on usual and customary fees for 28 separate procedures (fifteen surgical, five radiological, two laboratory, and six medical) weighted by the frequency of their performance. Because of these methodological differences direct comparison between the two indices cannot be drawn.

The fee data collected by the Bureau of Research and Planning are submitted by almost 800 randomly selected physicians in private practice throughout the state. They represent general practice and all specialties involved in the performance of the selected procedures.

During the same time period, the overall Medical Care Index, according to the Bureau of Labor Statistics, rose 2.0 per cent in Los Angeles and 3.4 per cent in San Francisco. This index, in addition to physicians' fees, includes hospitalization rates and hospitalization insurance, which have generally been rising at a faster rate than physicians' fees during the past several years, dentists' fees and surgical insurance, which have been rising at approximately the same rate as physicians' fees, optometric fees, which have been rising more slowly, and drug prices, which have been decreasing slightly.

693 Sutter Street, San Francisco, California 94102.

CALIFORNIA PHYSICIAN FEE INDEX*

June 1962—December 1963

(June 1962=100)

Quarter and Year	*Index*
June 1962	100.0
September 1962	100.6
December 1962	101.6
March 1963	103.0
June 1963	103.9
September 1963	104.8
December 1963	105.8

*Prepared by the Bureau of Research and Planning, California Medical Association, from data supplied by almost 800 randomly selected physicians in private practice throughout the state.

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CALIFORNIA MEDICAL ASSOCIATION

1965 Annual Scientific Assembly

Fairmont and Mark Hopkins Hotels, San Francisco, March 28-31, 1965

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686 East Union Street, Pasadena 91101

DERMATOLOGY AND SYPHILOLOGY Charles G. Steffen, M.D.
250 West Badillo, Covina 91722

EAR, NOSE AND THROAT G. Howard Gottschalk, M.D.
8618 Sepulveda Boulevard, Los Angeles 90045

EYE Richard Kratz, M.D.
15225 Van Owen, Van Nuys 91405

GENERAL PRACTICE J. Blair Pace, M.D.
408 Cassidy Street, Oceanside 92054

GENERAL SURGERY T. Newlin Hastings, M.D.
1136 West 6th, Los Angeles 90019

INDUSTRIAL MEDICINE AND SURGERY Leon R. Rudnic, M.D.
15921 East 14th Street, San Leandro 94578

INTERNAL MEDICINE Robert L. Paver, M.D.
384 Post Street, San Francisco 94108

OBSTETRICS AND GYNECOLOGY Lester T. Hibbard, M.D.
1930 Wilshire Boulevard, Room 607, Los Angeles 90057

ORTHOPEDICS David C. Monsen, M.D.
2300 South Hope Street, Los Angeles 90007

PATHOLOGY AND BACTERIOLOGY Donald L. Alcott, M.D.
Santa Clara County Hospital, South Bascom Avenue, San Jose 95128

PEDIATRICS Richard L. Anderson, M.D.
636 Harris Street, Eureka 95501

PHYSICAL MEDICINE Rene Cailliet, M.D.
4900 Sunset Boulevard, Los Angeles 90027

PREVENTIVE MEDICINE AND PUBLIC HEALTH Henrik L. Blum, M.D.
P.O. Box 871, Martinez 94554

PSYCHIATRY AND NEUROLOGY Stanley A. Skillicorn, M.D.
700 Medico-Dental Building, San Jose 95113

RADIOLOGY Victor G. Mikity, M.D.
1200 North State Street, Los Angeles 90033

UROLOGY Carl K. Pearlman, M.D.
1518 North Sycamore, Santa Ana 92701

In Memoriam

Barron, Alexandre, Stockton. Died May 21, 1964, in Stockton, aged 53, of cerebral vascular accident. Graduate of the University of California School of Medicine, Berkeley-San Francisco, 1934. Licensed in California in 1934. Doctor Barron was a member of the San Joaquin County Medical Society.

✤

Beede, Charles G., Merced. Died June 8, 1964, in an airplane crash, aged 44. Graduate of the University of Nebraska College of Medicine, Omaha, 1948. Licensed in California in 1954. Doctor Beede was a member of the Merced County Medical Society.

✤

Benton, Julian Juriah, Berkeley. Died June 7, 1964, in Berkeley, aged 90, of acute pulmonary edema due to left ventricular failure. Graduate of New York University College of Medicine, New York, 1900. Licensed in California in 1901. Doctor Benton was a member of the Alameda-Contra Costa Medical Association, a life member of the California Medical Association, and a member of the American Medical Association.

✤

Binkley, Robert Wilson, Selma. Died May 28, 1964, aged 70. Graduate of the University of California School of Medicine, Berkeley-San Francisco, 1918. Licensed in California in 1918. Doctor Binkley was a member of the Fresno County Medical Society.

✤

Boonshaft, Louis, Encino. Died May 14, 1964, in Sherman Oaks, aged 74, of coronary occlusion. Graduate of St. Louis College of Physicians and Surgeons, Missouri, 1913. Licensed in California in 1917. Doctor Boonshaft was a member of the Los Angeles County Medical Association.

✤

Cagney, Harry Vincent, Hollywood. Died June 10, 1964, in Los Angeles, aged 66, of heart disease. Graduate of Columbia University College of Physicians and Surgeons, New York, New York, 1925. Licensed in California in 1940. Doctor Cagney was a member of the Los Angeles County Medical Association.

✤

Chase, Robert N., San Rafael. Died May 3, 1964, in San Francisco, aged 44, of adenocarcinoma of the colon. Graduate of State University of Iowa College of Medicine, Iowa City, 1943. Licensed in California in 1946. Doctor Chase was a member of the Marin Medical Society.

✤

Cole, Clifford B., Long Beach. Died May 26, 1964, in Long Beach, aged 47, of cancer. Graduate of the University of Tennessee College of Medicine, Memphis, 1940. Licensed in California in 1947. Doctor Cole was a member of the Los Angeles County Medical Association.

✤

Collins, Vernon J., Redding. Died April 22, 1964, in Redding, aged 63, of heart disease. Graduate of the College of Osteopathic Physicians and Surgeons, Los Angeles, 1935. Licensed in California in 1935. M.D. degree from California College of Medicine, 1962. Doctor Collins was a member of the Forty First Medical Society.

✤

Davis, Albert D., San Francisco. Died May 30, 1964, in San Francisco, aged 73. Graduate of the University of Nebraska College of Medicine, Omaha, 1921. Licensed in California in 1926. Doctor Davis was a member of the San Francisco Medical Society.

✤

Devereux, Robert, San Jose. Died May 25, 1964, in San Francisco, aged 82, of heart disease. Graduate of Temple University School of Medicine, Philadelphia, Pennsylvania, 1909. Licensed in California in 1955. Doctor Devereux was a member of the Santa Clara County Medical Society.

✤

Dunn, Lawrence M., Santa Maria. Died February 15, 1964, aged 57, of carcinoma of the lung. Graduate of Northwestern University Medical School, Chicago, Illinois, 1934. Licensed in California in 1946. Doctor Dunn was a member of the Santa Barbara County Medical Society.

✤

Groomes, Charles A., Medford, Oregon. Died May 11, 1964, in Medford, Oregon, aged 76. Graduate of the University of Michigan Medical School, Ann Arbor, 1913. Licensed in California in 1952. Doctor Groomes was a member of the Sacramento Society for Medical Improvement.

✤

Haskell, Pliny Fisk, Artesia. Died May 15, 1964, in Bellflower, aged 87, of cerebral vascular accident. Graduate of American Medical Missionary College, Battle Creek, Michigan, and Chicago, Illinois, 1902. Licensed in California in 1912. Doctor Haskell was a member of the Los Angeles County Medical Association, a life member of the California Medical Association, and a member of the American Medical Association.

✤

Hershman, Frederick, Los Angeles. Died May 6, 1964, in Los Angeles, aged 77, of cerebral hemorrhage. Graduate of Indiana University School of Medicine, Bloomington-Indianapolis, 1910. Licensed in California in 1914. Doctor Hershman was a member of the Los Angeles County Medical Association.

✤

Janis, Leonard J., Pacific Beach. Died May 7, 1964, in La Jolla, aged 46, of a brain abscess and streptococcal infection. Graduate of St. Louis University School of Medicine, Missouri, 1943. Licensed in California in 1948. Doctor Janis was a member of the San Diego County Medical Society.

✤

Judd, Merrill Hubert, Los Altos. Died May 3, 1964, in San Francisco, aged 61. Graduate of the University of Colorado School of Medicine, Denver, 1928. Licensed in California in 1958. Doctor Judd was an associate member of the Santa Clara County Medical Society.

✤

Logan, Joseph A., Fresno. Died May 13, 1964, in Fresno, aged 49, of heart disease. Graduate of Baylor University College of Medicine, Houston, Texas, 1941. Licensed in California in 1946. Doctor Logan was a member of the Fresno County Medical Society.

✤

Meltzer, A. M., San Jose. Died May 22, 1964, in San Jose, aged 58. Graduate of Rush Medical College, Chicago, Illinois, 1935. Licensed in California in 1936. Doctor Meltzer was a member of the Santa Clara County Medical Society.

MEYER, ANDREW H., Oakland. Died May 27, 1964, in Oakland, aged 50, of acute myocardial infarction. Graduate of McGill University Faculty of Medicine, Montreal, Quebec, Canada, 1940. Licensed in California in 1941. Doctor Meyer was a member of the Alameda-Contra Costa Medical Association.

✤

RANTZ, LOWELL ADDISON, Palo Alto. Died June 5, 1964, in Boston, Massachusetts, aged 52, of heart disease. Graduate of Stanford University School of Medicine, Palo Alto-San Francisco, 1936. Licensed in California in 1936. Doctor Rantz was a member of the Santa Clara County Medical Society.

✤

RIGG, MARILYN LOUISE MARTIN STORY, Pasadena. Died June 8, 1964, in Pasadena, aged 41. Graduate of Woman's Medical College of Pennsylvania, Philadelphia, 1948. Licensed in California in 1949. Doctor Rigg was a member of the Los Angeles County Medical Association.

✤

RUDDOCK, JOHN CARROLL, Los Angeles. Died May 14, 1964, in Glendale, aged 73, of heart disease. Graduate of the University of California School of Medicine, Berkeley-San Francisco, 1916. Licensed in California in 1916. Doctor Ruddock was a member of the Los Angeles County Medical Association.

✤

SMITH, HARRY C., Glendale. Died May 14, 1964, in Glendale, aged 88. Graduate of Eclectic Medical College, Cincinnati, Ohio, 1899. Licensed in California in 1912. Doctor Smith was a retired member of the Los Angeles County Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✤

STIEFEL, ADOLF, Patton. Died May 22, 1964, in San Bernardino, aged 67. Graduate of Ludwig-Maximilians-Universität Medizinische Fakultät, München, Bavaria, Germany, 1924. Licensed in California in 1948. Doctor Stiefel was a member of the San Bernardino County Medical Society.

✤

THOMAS, WALTER R., San Gabriel. Died May 31, 1964, in Los Angeles, aged 52. Graduate of the College of Osteopathic Physicians and Surgeons, Los Angeles, 1944. Licensed in California in 1944. M.D. degree from California College of Medicine, 1962. Doctor Thomas was a member of the Forty First Medical Society.

✤

TOWNLEY, FRANK N., Corning. Died May 12, 1964, in Corning, aged 43, of heart disease. Graduate of the University of Nebraska College of Medicine, Omaha, 1944. Licensed in California in 1947. Doctor Townley was a member of the Tehama County Medical Society.

✤

TRAINOR, MELVERTON E., Los Angeles. Died May 16, 1964, in Los Angeles, aged 82, of cerebral vascular accident. Graduate of Minneapolis College of Physicians and Surgeons, Minnesota, 1907. Licensed in California in 1920. Doctor Trainor was a member of the Los Angeles County Medical Association.

✤

VIOLETT, CHARLES C., San Bernardino. Died May 31, 1964, in San Bernardino, aged 100. Graduate of the University of Louisville School of Medicine, Kentucky, 1892. Licensed in California in 1904. Doctor Violett was a member of the San Bernardino County Medical Society, a life member of the California Medical Association, and a member of the American Medical Association.

✤

WIGHTMAN, ARDATH HARRISON, Laguna Beach. Died May 25, 1964, in Laguna Beach, aged 62. Graduate of Northwestern University Medical School, Chicago, Illinois, 1929. Licensed in California in 1929. Doctor Wightman was a member of the Orange County Medical Association.



PUBLIC HEALTH REPORT

MALCOLM H. MERRILL, M.D., M.P.H.
Director, State Department of Public Health

In 1961, and again in 1963, the Legislature requested the State Health Department to investigate fatal cases of aplastic anemia associated with the use of chloramphenicol. In its request of last year, the Legislature urged the California Medical Association to take steps to extend its efforts towards the education of its members and to investigate and report on any and all drugs of a dangerous nature.

The present study of fatal cases of aplastic anemia has been planned and is being conducted in a manner similar to the joint study of maternal and neonatal deaths, and with the cooperation of CMA and the California Pharmaceutical Association.

For purposes of the study the state has been divided into five regions. Regional committees, supported by consultants, will review each case. Initially, a pilot study is being undertaken in the San Francisco Bay area. Each regional committee will consist of a hematologist, a pathologist, a public health physician and three physicians in clinical practice.

There are two aspects of the study, case reviews and survey of physicians and pharmacies to obtain information on the number of patients receiving chloramphenicol.

In the first phase, special consultants nominated by the CMA and appointed by the department are making detailed studies of fatal cases of aplastic anemia. Cases associated with chloramphenicol and those not so associated are being studied.

The summary they make will be as complete as possible, utilizing reviews with the physician last in charge of the patient, hospital records and other physicians who have had contact with the case. Absolute confidentiality is insured by state law and will be maintained in connection with all data found during the study.

Purpose of the survey is to ascertain, as feasible, by a postcard query of a nine per cent sample of the physicians and pharmacies in California the number of persons in the state who have received chloramphenicol during the period of study, irrespective of reason or associated toxic reactions. It is the hope to obtain a basis to estimate risk of aplastic anemia to persons receiving the drug.

The 1964 influenza A outbreak in California has now subsided, although it remains possible that a few sporadic cases and laboratory confirmations will continue to be observed.

The outbreak was of only moderate severity when compared with epidemics of earlier years, especially that which occurred in 1960. Although the virus was disseminated throughout most regions of the state, there was no evidence of severe crippling of communities due to widespread respiratory disease.

The early indications that the effects of influenza A were being felt statewide were seen in the reporting of pneumonia-influenza deaths from eight California cities. During the week ended February 29 a rise above the epidemic threshold was observed which was sustained for the following 11 weeks. During the 12-week period there were 686 deaths attributed to pneumonia-influenza.

The Special Surveillance Section of the State Health Department wishes to extend its appreciation to those who participated in the contribution of data making these reports possible, and welcome suggestions which would improve the epidemiological study of this important disease.

LETTERS *to the Editor*

The Early Cancer Cytopathology and the "Nothing Lesion"

Dr. Lewis Guiss has written an admirable and concise paper "Cancer of the Upper Digestive and Respiratory Tracts." * There are few physicians in Southern California who have committed themselves to and commingled with early cancer, more than Dr. Guiss. Nevertheless, his statement "evaluating *visible* lesions by examination of exfoliated cells can only be regarded as expensive, inconclusive, and responsible for delay in beginning therapy," deserves direct and distinct dissent. He has understated the "nothing cancer," and left oral cytology with but faint praise.

Possibly the greatest breakthrough in modern clinical cancer awareness is the fundamental realization that early epithelial cancer is undetectable by the medical eye. This *in situ* carcinoma generally remains undetectable through the greater part of its biologic life. Any definition or basic concept of early cancer must refer to and include full awareness of this long, clinically invisible in situ stage of epithelial cancer.

Early cancer is highly curable, clinically innocuous, or invisible, and susceptible only to sensitive cytological techniques. This is the "nothing stage" of subclinical cancers; stage zero. The suspicious clinical lesion is by biologic definition *not* an early lesion. The early lesion is by definition invisible or nonsuspicious.

How clinically suspicious are the vast majority of in situ cancers of the cervix? What gynecologist does not readily admit his grateful dependence on the spectrum of subclinical data offered him by cytologic techniques?

In like manner, in situ oral mucosal cancers are: (1) Squamous; (2) In situ as long or longer than their squamous cervical cousins, and (3) As undetectable, innocuous and clinically inapparent in situ as their cervical counterparts; (4) Require surface cytology for sensitive, accurate cyto-evaluation.

Cancer of the cervix has amply proven that a suspicious lesion is not an early lesion, and an early lesion is inapparent, or, if apparent, clinically considered a "nothing lesion." This "nothing lesion" is detectable by (1) awareness and (2) something to scrape with. By all means, biopsy suspicious lesions. This dictum does not exclude cytologic examination on the "nothing lesion." In the "nothing lesions" rest the pre-suspicious, highly curable cancers. The recent Veterans Administration survey on oral cancer† revealed fully 10 per cent of proven oral carcinoma would not have been scraped had not the survey dictated that all oral lesions were to be studied. In other words, 10 per cent of proven cancers were completely unsuspected by the cancer conscious participating dentists; these are "nothing cancers."

Exfoliative cytology and its impact on detecting occult, inapparent carcinoma, needs emphasis, particularly to our dental colleagues who see so many mouths. Oral cytology, respectfully handled, will bring to dentists heightened awareness of the "soft tissues of the mouth" and bring to oral cancer, a multitude of professional eyes sophisticatedly alert to inapparent, in situ cancer. A real delay in early cancer detection rests in the assumption that *biopsy* of suspicious lesions detects *early* cancer.

The future of early cancer detection is cytologic examination of "nothing lesions," be these of the cervix, bronchial, or oral mucosa. I trust and believe Dr. Lewis Guiss can only agree, since he, more than most physicians, is highly aware of and sensitive to, the need for *early* cancer detection. The "nothing" clinical cancer predates the suspicious lesion.

Marvin B. Rodney, M.D.

*Guiss, Lewis, Cancer of the Upper Digestive and Respiratory Tracts, California Medicine 100:271 (1964) April.

†Interim Report of Veterans Administration Cooperative Study of Cytology, U.S. Government Printing Office, Washington, D.C. (1960) Nov.

ACCENTUATION

Doctor, your wife can succeed in being a very important personage—but not without really trying . . . and you can help her to help you by urging her to join the Auxiliary, for by joining she can:

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¶ Accentuate her sphere of influence through 21,000 physicians instead of but one.

¶ Accentuate her appreciation of the friendly approach and realistic evaluation of common problems.

¶ Accentuate her satisfaction in reciprocity by personal contributions of service to your community.

¶ Accentuate her desire to preserve the dignity of personal independence and freedom.

¶ Accentuate her belief in the importance of concentrated aid to improve and further medical education.

¶ Accentuate her understanding that a chairmanship is the result of workmanship; that advicemanship can reach its limit quickly.

¶ Accentuate her determination to subdue an agile mouth and extend an agile mind.

¶ Accentuate her ability to communicate about medicine objectively, calmly and factually.

¶ Accentuate her pride in the unswerving advance of medical knowledge and attainments.

¶ Accentuate her faith in the ability, the ideals, the moral strength of physicians' wives.

¶ Accentuate her confidence in women who can work together, plan together, play together, in harmony to advance a common goal.

¶ Accentuate her opportunity to be a part of the power explosion when the Woman's Auxiliary to the California Medical Association becomes a 21,000-member partnership with 21,000 physicians—all committed simply to the perpetuation of scientific medicine and to preservation of the physician as an individual.

MRS. SAMUEL K. BACON, *First Vice President*

NEWS & NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

The Second Annual Fall Meeting of the **American College of Physicians** will be held October 8-10 at the Hotel Biltmore in Los Angeles.

Basic science lectures will be given by G. D. McCann, Ph.D., California Institute of Technology, Pasadena, on "Toward a True Understanding of the Nervous System"; by Lawrence E. Lamb, M.D., of the U.S. Air Force School of Aero-Space Medicine, Brooks Air Force Base, Texas, on "Space Medicine," and by Findlay E. Russell, M.D., Loma Linda University School of Medicine, Los Angeles, on "Injuries by Venomous Animals."

Joseph F. Sadusk, Jr., M.D., Washington, D.C., new medical director of the Federal Food and Drug Administration, will participate in a panel discussion on drug safety.

* * *

The Los Angeles Pediatric Society met on May 14, 1964 and elected the following new officers: Dr. William D. Misbach, president; Dr. Harvey Shipper, vice-president; Dr. J. Richard Settelmayer, secretary-treasurer; and Dr. Lafayette E. Burns, member at large.

* * *

Applications are being invited for a National Institute of Mental Health **fellowship in child psychiatry for pediatricians** to begin July 1, 1965. The appointment is for one year and the stipend is $10,000 per annum. Applicants must be out of medical school at least five years, board certified or eligible and United States citizens.

The facilities used are those of the Los Angeles County General Hospital Child Psychiatry Service which has both inpatient and outpatient services for children and adolescents.

The deadline for applications is November 1, 1964. Further information may be obtained from Dr. Joseph D. Teicher, director of Children's Psychiatric Services, 1934 Hospital Place, Ward 6B, Los Angeles, California 90033.

* * *

The Reiss-Davis Clinic for Child Guidance will hold its Eleventh Annual **Institute in Child Psychiatry for Pediatricians** on November 14, 1964. This institute is cosponsored by the Southern California Chapter of the American Academy of Pediatrics.

This year during the Institute, the first annual Harold C. Bernstein Memorial Lecture will be given by Dr. Milton J. E. Senn, director of the Yale Child Study Center.

Further information may be obtained from Dr. R. L. Motto, 9760 West Pico Boulevard, Los Angeles.

SANTA CLARA

Dr. Sidney Raffel, executive head of the Department of Microbiology, has been appointed **acting dean** of the Stanford University School of Medicine.

Dr. Raffel will replace Dean Robert H. Alway who asked to be relieved of his administrative duties last December. He will remain in his new capacity until a new dean is selected.

GENERAL

The State Department of Public Health has mailed registration renewal forms for the biennial **radiation source registrations** required by the California Radiation Control Law. The current registration will cover the period July 1964 to June 1966. A fee of $10 is charged for each unit registered. Persons with radiation sources not yet registered under the law will be expected to do so.

Since 1960 all users of radiation machines, and certain possessors of radioactive materials, have been required to register. The requirement covers radiographic, fluoroscopic and therapeutic x-ray equipment in use by physicians and surgeons, osteopaths, dentists, chiropractors, podiatrists, veterinarians and other members of the healing arts, and machines in non-medical use such as industrial radiographic and fluoroscopic x-ray equipment, x-ray diffractional units, accelerators, electron microscopes, and all other radiation producing machines. Certain generally licensed radioactive material users are also required to register.

The Hawaii Medical Association is planning a scientific session to be held at the Sheraton Hotel, Kaanapali, Maui, August 13-16, 1964.

There will be three well-known professors in Hawaii in August and they have been invited to participate, providing a varied and outstanding scientific program. **The visiting professors** are Drs. Sydney S. Gellis, professor of pediatrics of the Boston University School of Medicine; Irwin T. Kaiser, department of Obstetrics/Gynecology, University of Utah College of Medicine; and Henry T. Bahnson, head of surgery at the University of Pittsburgh School of Medicine.

The registration fee for non-members of Hawaii Medical Association is $25.00. Reservations should be made direct with Mrs. Mary Jane Maples, Inter-Island Trade Wind Tours, 307 Lewers Road, Honolulu, Hawaii 96815.



EDUCATION NOTICES

Meetings and Courses

COMMITTEE ON CONTINUING MEDICAL EDUCATION

THIS BULLETIN of the dates of continuing education programs and the meetings of various medical organizations in California is supplied by the Committee on Continuing Medical Education of the California Medical Association. In order that they may be listed here, please send communications relating to your future meetings or postgraduate courses to Committee on Continuing Medical Education, California Medical Association, 693 Sutter Street, San Francisco, California 94102.

Medical Meetings

AUGUST MEETINGS

August 11-14—**American Society for Pharmacology and Experimental Therapeutics.** San Francisco. Tuesday-Friday. Contact: H. George Mandel, secretary, George Washington University School of Medicine, Washington 5, D.C.

August 13-16—**Hawaii Medical Association Interim Scientific Session.** Sheraton-Maui Hotel, Kaanapali, Maui. Thursday-Sunday. Non-members, $25. Contact: Mrs. Mary Jane Maples, 307 Levers Road, Honolulu, Hawaii 96815.

SEPTEMBER MEETINGS

September 10-November 5—**Stockton Postgraduate Study Club.** Scottish Rite Temple, 33 West Alpine, Stockton. Thursdays weekly, except October 1. Contact: James V. Roche, M.D., program chairman, 645 West Harding Way, Stockton.

September 19—**Second Northern California Athletic Injury Conference.** Sponsored by Butte-Glenn Medical Society and Chico State College. To be held at Chico State College 8:30 a.m. to 5:30 p.m., Saturday. Contact: Robert S. Johnson, M.D., chairman, 4 Cohasset Circle, Chico.

September 24-26—**American College of Obstetricians and Gynecologists** (District 8). San Diego. Thursday-Saturday. Contact: Donald F. Richardson, executive director, 79 West Monroe, Chicago 3.

September 27-October 2—**Flying Physicians Association.** Tenth Annual Meeting. Riviera Hotel, Palm Springs. Sunday-Friday. Contact: John C. Chatterton, staff representative, Flying Physicians Association, 332 South Michigan Avenue, Chicago 60604.

September 30-October 2—**34th Annual Postgraduate Symposium on Heart Disease**—St. Francis Hotel, San Francisco. Contact: Mr. Gene C. Taylor, executive director, American Heart Association, 259 Geary Street, San Francisco.

OCTOBER MEETINGS

October 8-10—**The American College of Physicians Fall Sectional Meeting.** Contact: Edward C. Rosenow, Jr., M.D., executive director, The American College of Physicians, 4200 Pine Street, Philadelphia 4, Pennsylvania.

October 11-16—**American Society of Plastic and Reconstructive Surgeons.** Fairmont Hotel, San Francisco. Sunday-Friday. Contact: Paul P. Pickering, M.D., executive secretary, 2850 Sixth Avenue, Suite B, Lower Level, San Diego.

October 16-17—**Western Industrial Medical Association.** Biltmore Hotel, Los Angeles. Friday-Saturday. Contact: Christine Einart, M.D., executive secretary, 2151 Berkeley Way, Berkeley 4.

October 25-28—**Academy of General Practice 16th Annual Scientific Assembly.** Hilton Hotel, San Francisco. Sunday-Wednesday. Sir John Bruce, Professor of Clinical Surgery, University of Edinburgh, Scotland, will be one of the principal speakers. Contact: Academy of General Practice, No. 9 First Street, San Francisco.

FUTURE MEETINGS

November 4-7—**61st Annual Meeting of Nevada State Medical Association and 13th Annual Conference of Reno Surgical Society—Joint Meeting.** Reno.

November 12-15—**San Diego Chapter of the California Academy of General Practice Ninth Scientific Symposium.** Las Vegas.

December 1-4—**5th Annual Presentation of the Postgraduate Course in Cardiology: "The Heart in the Electronic Age."** Scripps Clinic and Research Foundation, La Jolla.

December 2-4—**West Coast Allergy Society Annual Meeting.** Los Angeles.

Postgraduate Education

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University of California at Los Angeles

August 7-9 — **Controversial Areas in Anesthesiology.** Friday-Sunday. 18 hours.*

August 9-12—**Advanced Seminars in Internal Medicine.** University of California Residential Conference Center, Lake Arrowhead. Wednesday-Sunday. $100 plus room and board.†

August 12-16—**Fifth Annual Advanced Seminars in Dermatology.** University of California Residential Conference Center, Lake Arrowhead. Wednesday-Sunday. $100 plus room and board.

August 20-22—**Progress in Obstetrics.** Thursday-Saturday. 18 hours.*

August 23-26—**Seminars on Medical Teaching.** University of California Residential Conference Center, Lake Arrowhead. Sunday-Wednesday. No fee.†

October 16-November 6—**Postgraduate Medical Lecture Series in Australia and New Zealand.** Monday-Friday. 32 hours. $200.

Dates by Arrangement—**Clinical Traineeship**—Anatomy, Anesthesia, Dermatology, Pediatrics, Radioisotopes, Urology: 2 weeks, $150; 4 weeks, $250. Minimum period, 2 weeks.

For information on courses for physicians or ancillary personnel, contact: Thomas H. Sternberg, M.D., Assistant Dean and Head, Department of Continuing Education in Medicine and Health Sciences, U.C.L.A. Medical Center, Los Angeles 24, 478-9711, Ext. 2114.

Loma Linda University

As Arranged—**Traineeships** in clinical and other departments are available by arrangement with department chairmen of the Postgraduate Division. 80 hours minimum.

Anesthesia, 6 months. 250-300 hours. $350.

Pulmonary Diseases—can be arranged.

Continuously—**Illustrated Medical Lectures:** 30-minute tape recordings and accompanying 35-mm filmstrip, 50 to 80 full-color pictures for screen, hand or desk viewer. Available individually or by subscription. 12 or 36 titles per year, all titles produced in one year in any chosen specialty. Projectors and viewers included in subscription plans. Contact: Loma Linda University, Illustrated Medical Lectures, Los Angeles 33.

For course information contact: W. F. Norwood, Ph.D., Assistant Dean and Chairman, Division of Continuing Education, Loma Linda University School of Medicine, 1720 Brooklyn Ave., Los Angeles, California 90033, ANgelus 9-7241, Ext. 214.

University of California, San Francisco

July 1-June 30—**Course in the Principles and Clinical Uses of Radioisotopes.** Three months full-time optional choice of time. $350.

September 8-April 27—**Radiological Physics.** Tuesday evenings. 45 hours. $150.

September 14-16—**Recent Advances in Internal Medicine: Clinics and Demonstrations.** Monday-Wednesday. 17 hours. $60.

September 15-December 8—**Medical Radio Conferences.** Northern California.*†

September 17-December 10—**Medical Radio Conferences.** Northern California.*†

September 18-19—**Pediatrics—Cerebral Palsy and Related Disorders.***†

*Fee to be announced.
†Hours to be announced.

September 18-October 23—**Neuropsychiatric Management in Daily Practice.** Modesto State Hospital. Friday evenings. 12 hours. $10.

September 22-October 27—**Mental Retardation: Problems and Approaches.** Sonoma State Hospital. Tuesday evenings. 12 hours. $10.

September 23-December 16—**Psychotherapeutic Principles and Practice for Non-Psychiatrists.** Langley Porter Neuropsychiatric Institute. Wednesdays. 72 hours. $25.

September 24-October 29 — **Psychosomatic Aspects of Daily Practice.** Napa State Hospital. Thursday evenings. 12 hours. $10.

September 26-27—**Complications: Medical and Surgical Management.** Franklin.*†

September 26-27—**Neuropsychiatry for the Non-Psychiatric Physician in General Practice.** Sacramento.*†

September 29-November 3 — **Clinical Considerations in Mental Retardation.** Sonoma.*†

October 3-4—**Psychiatric Management in General Medicine.** San Mateo.*†

October 6-December 8—**Evening Lectures in Medicine.** Oakland Hospital. Tuesday evenings. 16 hours. $35.

October 8-10—**Obstetrics and Gynecology.***†

October 10-11—**Cytology Symposium.***†

October 13-November 24—**Neuropsychiatry in Daily Practice.** Agnews State Hospital. Tuesday evenings. 12 hours. $10.

October 16-17—**Surgery of the Hand and Forearm.***†

October 17—**Infectious Diseases in Childhood.** Children's Hospital.*†

October 22-24—**Southwestern Medical Association.** Las Vegas.*†

October 30-November 1—**2½ Day Symposium on Mental Retardation for General Practitioners, Non-Psychiatrists and Paramedical Specialists.***†

Continuously—Courses presented by special arrangement: Principles and Clinical Uses of Radioisotopes (full time, one to three months).

For information on courses for physicians or ancillary personnel, contact: Seymour M. Farber, M.D., Assistant Dean, Dept. of Continuing Education in Medicine and Health Sciences, University of California Medical Center, Room 565-U, San Francisco 22, MOntrose 4-3600, Ext. 179.

University of Southern California

Aug. 1-12—**Seventh Annual Postgraduate Refresher Course in Hawaii.** $100.

October 18-November 9 — **Medical Centers of South America.** 36 hours. $210.

Continuously—**Basic Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $100. Physicians may register at any time.

Continuously—**Advanced Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $85. Physicians may register at any time.

For course information contact: Phil R. Manning, M.D., Assoc. Dean, Postgraduate Division, USC School of Medicine, 2025 Zonal Ave., Los Angeles 90033, CApital 5-1511, Ext. 300.



The Physician's BOOKSHELF

THE DEVELOPMENT OF THE BRAIN AND ITS DISTURBANCE BY HARMFUL FACTORS—B. N. Klosovskii. Translated from the Russian and edited by Basil Haigh, M.A., M.B., B.Chir. A Pergamon Press Book, distributed by the Macmillan Company, 60 Fifth Avenue, New York 11, pursuant to a special arrangement with Pergamon Press Limited, Oxford, England, 1963. 275 pages, $9.75.

This monograph is based on work carried out under the personal direction of Professor B. N. Klosovskii, a Soviet Academician, at his Psychoneurological Clinic in the Laboratory for the Study of Brain Development, Moscow. Thus it introduces the research activity and views of Soviet workers in the field of disordered cerebral embryogenesis, and factors disturbing development, such as asphyxia, whooping cough, thyroid disorders, diabetes, quinine, prematurity, trauma, and malnutrition. A second volume, being prepared for publication, may fill some of the gaps in this monograph.

As Soviet contributions in this field have not been readily available, this monograph is of great interest to those with research interest in mental retardation — a field now attracting the unified efforts of neurologists, pediatricians, obstetricians, biochemists, geneticists, psychologists, etc. Funds recently made available by Congress have encouraged such interest.

DONALD MACRAE, M.D.

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INDUSTRIAL BLADDER CARCINOGENESIS—I. S. Temkin. Translated by John J. Oliver. English Translation edited by William J. P. Neish. A Pergamon Press Book, The Macmillan Company, 60 Fifth Avenue, New York 11, N.Y., 1963. 367 pages, $12.50.

This monograph from the Soviet Union contains the data collected since 1936 on aniline dye workers exposed to carcinogens. These data are detailed and exhaustive, and reflect careful observation and excellent follow-up. An historical review (with a proletarian slant) and a review of experimental vesical carcinogenesis makes the volume complete. It is a valuable work for purchase by the urologist with a special interest in bladder cancer, and for perusal by any physician seeing these cases.

F. H., JR.

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INFECTIOUS DISEASES OF THE CONJUNCTIVA AND CORNEA—Symposium of the New Orleans Academy of Ophthalmology—Henry F. Allen, M.D., Robert P. Burns, M.D., Wendell D. Gingrich, M.D., Isadore Givner, M.D., Samuel N. Key, Jr., M.D., Samuel J. Kimura, M.D., and Phillips Thygeson, M.D. The C. V. Mosby Co., 3207 Washington Blvd., St. Louis 3, Mo., 1963. 230 pages, $12.50.

This symposium fills a gap in the field of infections of the external eye. Each of the contributors covers his particular field thoroughly, adding a number of excellent clinical tips for the average ophthalmologist. The text reads well for the most part and would make a handy reference in the office.

The roundtable discussion at the end of the book covers a number of points of difference and makes for interesting reading.

PATIENT CARE AND SPECIAL PROCEDURES IN X-RAY TECHNOLOGY—2nd Edition—Carol Hocking Vennes, R.N., B.S., Part-time Clinical Instructor, University of Minnesota Hospital, Minneapolis, Minn.; formerly Surgical Supervisor and Clinical Instructor, University of Minnesota Hospital, Minneapolis, Minn.; and John C. Watson, R.T., Technical Consultant, Department of Radiology, Yale Medical Center and Grace-New Haven Community Hospital, New Haven, Conn.; formerly Director of Courses in X-ray Technology, University of Minnesota Hospitals, Minneapolis, Minn. The C.V. Mosby Company, 3207 Washington Boulevard, St. Louis 3, Mo., 1964. 228 pages, $6.25.

There is now available a revised edition of this excellent book first published in 1959. It should be compulsory reading for all student technicians and could profitably be read by medical students and nurses.

In the first three chapters general patient care and handling in the x-ray department is stressed, as well as the attitude of the technician to the patient. These most important subjects are usually inadequately treated in the average textbook for technicians.

There are chapters on fluoroscopy, routine and special procedures. Radiation protection for the patient and the technician is outlined. Sterile technique and the use of contrast agents is discussed. In the chapter on special procedures there is much excellent information concerning methods of bed-side radiography, neuroradiography, and care of the critically ill or isolated patient.

There has been extensive revision with much additional material in the chapter on vascular radiography. There is also a new chapter covering emergency room equipment and patient care.

The manual is well illustrated and indexed. It can be recommended without reservation to all student x-ray technicians, student nurses and their teachers.

M. E. MOTTRAM, M. D.

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MECHANISMS CONCERNED WITH CONCEPTION—Proceedings of a symposium prepared under the auspices of the Population Council and the Planned Parenthood Federation of America—Edited by Carl G. Hartman, Chairman of the Biological Research Committee of the Planned Parenthood Federation of America. A Pergamon Press Book, distributed by The Macmillan Company, 60 Fifth Avenue, New York 11, pursuant to a special arrangement with Pergamon Press Limited, Oxford, England, 1963. 526 pages, $17.50.

Each of the eight chapters of this volume consists of a review article by an authority in the field. Three of the chapters are concerned with the male: spermatogenesis, physiology of the male accessory organs, and composition and physiology of semen. Four chapters deal with the female: sperm migration in the female genital tract, oogenesis and ovulation, fertilization and transport of the ovum, and implantation mechanisms. The last chapter is on immunologic mechanisms and an appendix lists a dozen pages of unanswered questions. There are author and subject indexes.

Because the chapters are relatively long and the topics sufficiently general the book as a whole is better organized

and far more readable than most such reports of a conference. The significance of the book and the conference comes from the assembling of the findings of various fields into a common framework within which their relevance to each other may be assessed.

In medical and biological fields of inquiry it is often difficult to separate basic from applied research. The search for more natural and culturally more acceptable methods of conception control will become less empirical as knowledge of the mechanisms related to conception expands. The authors, therefore, are concerned not only with understanding the physiologic mechanisms but also with controlling them. In recent years a great deal of clinical research has been done in some phases of conception control such as the use of oral progestogens. It is unfortunate that this book has only recently been published since the material was presented during a symposium held in July, 1959. Much of the work has subsequently been published and references are given through 1962, but the novelty is gone.

The book will be of interest to students and research workers in reproductive biology including physicians interested in the newer methods of birth control.

E. J. Lamb, M.D.

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TECHNIQUES IN MEDICAL COMMUNICATION—Warner F. Bowers, A.B., B.Sc., M.D., M.S., Ph.D., F.A.C.S., Director, Graduate School of Medical Sciences, Professor of Clinical Surgery, Department of Surgery, New York Medical College Metropolitan Medical Center, New York City. Charles C. Thomas, Publisher, 301-327 East Lawrence Avenue, Springfield, Ill., 1963. 88 pages, $4.50.

This small book should be in use in the library of every medical author, and editor. Medically speaking, it contains material, including important do's and don't's, which is invaluable. Detailed consideration is given to the preparation of a medical paper, describing in detail the aims in collecting and analyzing data, in using statistics, and in preparing illustrations, such as graphs. Any person who wishes to improve his ability as a writer, a moderator, an administrator of a program, or especially as a speaker, should read and fully utilize the information in this book.

George C. Griffith, M.D.

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PATHOLOGY OF TUMOURS OF THE NERVOUS SYSTEM—Second Edition—Dorothy S. Russell, Sc.D., M.A., M.D., F.R.C.P., Late Director, Bernhard Baron Institute of Pathology, London Hospital; Emeritus Professor of Morbid Anatomy, University of London; and L. J. Rubinstein, M.D., Attending Neuropathologist, Montefiore Hospital, New York City; Associate Professor of Neuropathology, College of Physicians and Surgeons, Columbia University; Late Senior Lecturer in Morbid Anatomy, London Hospital Medical College. The Williams & Wilkins Co., Baltimore 2, Md., exclusive U.S. agents, 1963. 345 pages, $13.50.

That the splendid work of Professor Russell and Dr. Rubinstein and Professor Lumsden has, in four years, justified a second edition suggests that interest in the field of Central Nervous System neoplasia and its related tumorlike abnormalities evokes widespread interest and is the focus for investigators' tools. This very readable, beautifully illustrated and appropriately documented work represents, in the reviewer's opinion, the best work of its kind in the English language and should be in the library of all pathologists as well as those in the general field of neurological medicine and surgery. The new edition has expanded its size only modestly from 318 to 345 pages, the increase resulting from the addition of a welcome section upon pituitary tumors and an amplification of the chapter by Professor Lumsden on the application of the tissue culture technique in the study of central nervous system neoplasia. The references following each chapter have been updated and slightly expanded and are, as a consequence, appealing. The format of the work is unchanged. The tumor classifications have remained the same. The arguments in support of the clearly put opinions expressed remain sound and it is a pleasure to read the work of three authors which is so authoritative and represents the results of their personal experience. A small number of additional figures have been added, particularly in Professor Lumsden's chapter, in which illustrations of tissue culture of the polar spongioblastoma, the schwannoma and the fibrillary astrocytoma are provided.

This work has been put together with care. It is difficult to be critical except in a most complimentary fashion.

W. Eugene Stern, M.D.

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PSYCHIATRY FOR STUDENTS—David Stafford-Clark, M.D., F.R.C.P., D.P.M., Physician-in-Charge, Department of Psychological Medicine and Director of York Clinic, Guy's Hospital, London; Consultant Physician to the Bethlem Royal and Maudsley Hospitals, and to the Institute of Psychiatry in the University of London; with a chapter on Child Psychiatry by Gerard Vaughan, M.B., M.R.C.P., D.P.M., Physician-in-Charge, Department of Child Psychiatry, Guy's Hospital, London Consultant Psychiatrist to the Wood Vale Children's Reception Centre, London County Council; and an appendix on Clinical Psychology by Jessie Williams, M.A., Lately Consultant Clinical Psychologist, Guy's Hospital, London. Grune & Stratton, Inc., 381 Park Avenue South, New York 16, N. Y., 1964. 277 pages, $5.75.

In this book of 277 pages an attempt has been made to cover the subject of psychiatry, including a special chapter on the essentials of child psychiatry and an appendix on clinical psychology. In order to make this attempt it is understandable that the approach would be one in which brevity was stressed and such indeed is the case. Compared to other textbooks of psychiatry this is more of a handbook. The principal author presents clinical material with case illustrations in an effective manner, and along with this there is some theoretical discussion principally from a dynamic point-of-view.

One especially interesting feature of the book is a personal note expressed in a short foreword and in an epilogue. In the foreword the author points out that what he has attempted to stress is ". . . that clinical study of the subject must include an appreciation of how it feels to be the patient." In the epilogue the author discusses the relationship between the doctor and patient in which he expresses the opinion that the contribution of psychiatry to the problem of the treatment of a sick human being by a physician is summed up in a line from Arthur Miller's play, Death of a Salesman. The line spoken by the salesman's wife and addressed to their two sons and referring to her husband is: "Attention," she says, "attention must finally be paid to such a person . . ." The author continues and among other things writes "In the special context of this phrase 'attention' means not simply interest, not even simply compassion, but the active, dedicated, detached, but uncompromising love for other human beings which alone can inspire and ultimately crown the highest endeavors of medicine.

"The contribution of psychiatry to a fuller understanding of the principles and practice of medicine must ultimately then be to underline a single fundamental truth: the essential wholeness and dignity of man."

In addition to the fact that many important subjects are treated so briefly in this book, an American student would find it difficult to use because of the difference in the classification of mental illness used in England as compared with the United States.

Charles W. Tidd, M.D.

THE BIOCHEMICAL DIAGNOSIS OF HEART DISEASE—Clarence M. Agress, M.D., F.A.C.C., F.A.C.P., Associate Clinical Professor of Medicine, University of California, Los Angeles, California; Chief of Cardiology, Cedars of Lebanon Hospital, Los Angeles, California; and Harley M. Estrin, M.D., Research Cardiologist, Institute for Medical Research; Adjunct Attending Physician, Department of Medicine, Cedars of Lebanon Hospital, Los Angeles, California. (Publication Number 548, American Lecture Series. A Monograph in The Bannerstone Division of American Lectures in Living Chemistry. Edited by I. Newton Kugelmass, M.D., Ph.D., Sc.D., Consultant to the Departments of Health and Hospitals, New York, N.Y.) Published and distributed throughout the world by Charles C. Thomas, Publisher, Bannerstone House, 301-327 East Lawrence Avenue, Springfield, Ill., U.S.A., 1963. 173 pages, $7.75.

The determination of serum levels of SGOT and LDH and the recording of serial electrocardiograms constitute the most important laboratory technics for the precise diagnosis of acute myocardial infarction. Their value increases when the clinical picture is obscure. The serum enzyme levels become most important when, in addition, the electrocardiogram is already abnormal because of bundle branch block, ventricular hypertrophy or prior infarction.

The essential aspects of the serum enzymes and their application to the diagnosis of acute myocardial infarction are presented in the 107 pages of part one of this concise monograph. Biochemical features and technics of measurement especially of SGOT and LDH are described. There is only brief mention of isoenzymes. Changes in serum levels occurring in acute infarction are described and documented by data obtained from a review of the literature. The effect of other disease states upon enzyme levels is described.

The authors might well have stopped here for part two consisting of 58 additional pages entitled Other Biochemical Tests in Heart Disease contributes little additional value to the book. In this section there is discussed in a superficial manner a surprisingly wide variety of cardiac lesions and the familiar laboratory tests that are employed for diagnosis. Under rheumatic fever for example, ASO and the antihyaluronidase tests, C-reactive protein, SGOT, the Rose test, mucoprotein measurements and the latex-fixation test are all discussed in four pages. Cardiomyopathies, myocarditis, cardiac involvement by systemic disease, and miscellaneous lesions (traumatic heart disease, etc.) are discussed in a similar manner. Finally there is an 11 page summary of electrolytes in heart disease.

This monograph will provide the physician with a brief review of the application of serum enzymes to the diagnosis of acute myocardial infarction. Its complete bibliography will allow easy access to important original references.

H. N. Hultgren, M.D.

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THE LIMB-DEFICIENT CHILD—The Child Amputee Prosthetics Project, Department of Pediatrics, UCLA School of Medicine—Edited by Berton Blakeslee; Photography by Mary Louise Histon. University of California Press, Berkeley and Los Angeles, 1963. 391 pages, $8.50

CAPP at the University of California, Los Angeles has been afforded the opportunity through centralization and federal sponsorship to care for a large volume of child amputees. This experience forms the substance of The Limb-Deficient Child and the presentation of a total concept in management of these cases is the result.

The text takes up systematically the problems of the congenital amputee. The initial chapters allow for understanding and thus cooperation of the medical profession in handling of these rare and sometimes devastating deformities. Salient points in this section are the necessity for the "team" approach under a medical director; the spheres of activity of the family physician, social worker, orthopedic surgeon, prosthetist and physiotherapist; a brief background of the little known etiology of these deficiencies; a concise resume of the normal developmental pattern in infancy and childhood; an excellent understandable classification of the deformity and conservation and surgical procedures for their amelioration; the psychosocial problems associated with such birth defects; and the pre-prosthetic evaluation of patient with particular emphasis on a realistic expectation as to percentage gain in function.

The concluding chapters are of less interest to the medical profession as they are specialized to the actual design and fitting of types of artificial limbs, care of the prosthesis, clothing to be worn and training in the use of the various prostheses. The task of describing these technical matters is extremely difficult. The reader must have an excellent working background of prosthetics in general to absorb the material. One active day working in such a center would be worth a million words.

The style is tedious with considerable repetition and would bear trimming. Random valuation of mother's difficulties in pregnancy and associated anomalies adds nothing beyond the simple statement of a possible relationship.

The photography is limited for the subject is really dynamic and not still, the material three- and not two-dimensional. There is a desire by the reader to see these pictures "work" or to look from another angle.

The initial portion of the book is recommended to those who are even in casual contact with the child amputee, the latter chapters to those students who are able to get clinical exposure as well in preparation for active management of these cases.

F. Richard Schneider, M.D.

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RESTORATION OF FUNCTION AFTER BRAIN INJURY—A. R. Luria. Translated from the Russian by Basil Haigh, M.A., M.B., B.Chir. Translation edited by O.L. Zangwill, Professor of Experimental Psychology at the University of Cambridge. A Pergamon Press Book, distributed by the Macmillan Company, 60 Fifth Avenue, New York 11, N.Y., 1963 pursuant to a special arrangement with Pergamon Press Limited. 277 pages, $10.00.

This translation was taken from the Russian text which appeared in 1948 and remains unchanged since that date. The clinical basis of the treatise is experience gained by the author in the care of head injured patients from World War II. Leaning heavily on works of his countrymen the author's attempt to outline and document mechanisms for the restoration of function following various forms of head trauma is reasonably successful. Unfortunately the terminology loses some of its precision and therefore some of its clarity which may have been present in the original text.

His thesis may be amplified: Tissue destruction produces irreversible loss of function. Reversible disturbances of function are explained:

(a) By mechanisms of temporary suppression and dissociation. (Clinical examples are provided.) Restoration of inhibited sensory or motor function follows a pattern of return of firstly sub-sensory reflex activity followed by conscious sensory perception. The susceptibility of other defects in cell excitability and synapses to modification is documented by examples of improved motor function following the intravenous administration of prostigmine. The general concept of de-inhibition is presented as another method for the restoration of function through the application of appropriate psychotherapy.

(b) The second major mechanism for the restoration of function is the reorganization of functional systems, either by the substitution of centers in the opposite hemisphere or the re-organization of those elements of the same functional system which are uninvolved in the injury. To this end psychological reorganization is the most important technique

needed but is based on the assumption that the portions of the brain controlling motivation are not involved in the injury. A detailed exposition of examples of disturbed motor and gnostic function is presented and the restoration thereof is based upon indirect conceptual reorganization of function.

The largest of the individual chapters deals with speech in which a detailed analysis of speech problems, the techniques of speech training and the pattern of psychotherapy are offered.

The main theme of the work is to emphasize the importance of the psychological assessment and reorganization of the individual toward the use of those functions which are suitable for substitution and reorganization whereby man's residual capacity may serve him.

This book is a statement of concepts based heavily upon the Russian literature up to the time of writing. Its organization is that of a treatise, not a manual, but it is of practical importance to psychotherapists, speech therapists, those interested in rehabilitation and those interested in the general function of the brain from a psychological point of view.

It presents 124 references, mostly to Russian literature. There is a brief subject and author index and 59 simple graphs, line drawings and diagrams.

W. Eugene Stern, M.D.

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PSYCHOPHARMACOLOGICAL METHODS — Proceedings of a Symposium on the Effects of Psychotropic Drugs on Higher Nervous Activity held in Prague from October 30 to November 2, 1961 under the Auspices of the Society for the Study of Higher Nervous Activity, Section of Czechoslovak Medical Society—Edited by Zdenek Votava, Professor of Pharmacology, Charles' University Medical Faculty of Hygiene, Prague; Milan Horvath, Chief, Department of Physiology of Higher Nervous Activity, Institute of Industrial Hygiene and Occupational Diseases, Prague 10; Lecturer, Charles' University Medical Faculty of Hygiene, Prague; and Oldrich Vinar, Chief, Department of Psychopharmacology, Psychiatric Research Institute, Prague 8. A Pergamon Press Book, distributed by The Macmillan Company, New York, pursuant to a special arrangement with Pergamon Press Limited, Oxford, England, 1963. 360 pages, $14.00.

This book follows the now all too familiar pattern of presentation of a series of research papers in book form. In this case the reports should be of interest to American psychopharmacologists since most are written by Europeans whose work is not often seen in western journals. The book is not a summary of psychopharmacological methods as might be inferred from the title but does manage to present a wide spectrum of techniques as applied to drug studies in animals and humans. Naturally, the psychotropic drugs are the principal objects of study but other topics creep in here and there to vary the diet somewhat. The book is not for the practicing physician but might well be scanned by neurophysiologists and pharmacologists as well as experimental psychologists and psychiatrists.

H. W. Elliot, M.D.

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PRINCIPLES OF PUBLIC HEALTH ADMINISTRATION—Fourth Edition—John J. Hanlon, M.S., M.D., M.P.H., Director of Community Health Services, City of Philadelphia; Professor and Chairman, Department of Preventive Medicine and Public Health, Temple University School of Medicine, Philadelphia, Pa. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, Mo., 1964. 719 pages, $11.50.

This text has become indispensable for public health officers and other specialists in preventive medicine and also is a very good reference for any physician seeking to understand the point of view of public health workers. It provides an excellent brief summary of the history and philosophical development of public health practices. It provides information on the structure and function of public health organizations and sound practical guidance on their operations. While the author is progressive in outlook, he is fully appreciative of the merits of established customs and relationships in the administration of medical care in the United States. He is singularly able to discuss, in a dispassionate way, the relationships between public health organizations and practicing physicians and various proposals for modifying them. He has interesting chapters on the economic value of public health and preventive medicine.

The appearance of the second edition in 1955 marked the development of a comprehensive view of the subject with a good selection of references at the end of each chapter. It may be a measure of soundness of selection of these references that most of them are still appropriate. However, the past decade has seen considerable progress in several fields and one wishes that attention were directed to more of the new work. In particular, it is unfortunate that the studies of Odin Anderson of the Health Information Foundation and the book by Somers and Somers on health insurance have been left out. Also, significant advances have been made in environmental hygiene, but this has not been noted. It is particularly disappointing to see the progress in air pollution control which has been made in California ignored.

The numerous statistics quoted in the book have been brought up to 1961, in some cases, 1962, in comparison to the 1955 of the third edition. A few new sentences have been added and a few have been dropped. Except for these changes in statistics, the text is almost identical with the third edition.

Rodney R. Beard, M.D.

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CASE STUDIES IN OBSTETRICS AND GYNECOLOGY—F. Jackson Stoddard, M.D., Associate Clinical Professor of Obstetrics and Gynecology, Marquette University School of Medicine, Milwaukee, Wisconsin. W. B. Saunders Company, Philadelphia and London, 1964. 312 pages, $8.50.

Discussing interesting cases with a colleague is an almost universally practiced method of postgraduate education in clinical medicine, perhaps second in prevalence only to the discourses of the detail man. In this thin volume Doctor Stoddard combines case discussions with series of questions and answers. Sixty illustrative cases are presented and discussed in a format which sometimes suggests that they were transcribed from the more interesting grand rounds presentations and suitably edited to include the comments the discussant wished he had made. It is surprising that more books of this type have not appeared on the scene.

Although some references to review articles are given, many chapters have only two or three specific references — an unfortunate omission since many of the discussions are somewhat superficial and the statements and recommendations on controversial subjects dogmatic and provincial. It was not intended as a scholarly, comprehensive work. Because of these deficiencies the book can hardly be recommended to students and young residents even as a supplement to standard texts of obstetrics and gynecology. Since, however, each chapter can be read in a few minutes without much effort — a *Reader's Digest* of obstetrical literature — the book will undoubtedly find favor with the busy practitioner. One might expect to see a copy of this book on the table in the physicians' lounge near many delivery rooms. By providing light but instructive reading, this book should fill a definite need.

E. J. Lamb, M.D.

CIBA FOUNDATION STUDY GROUP NO. 13—Resistance of Bacteria to the Penicillins—in honour of Sir Charles Harington, K.B.E., Director, National Institute for Medical Research, 1942-1962. Edited by A. V. S. de Reuck, M.Sc., D.I.C., A.R.C.S., and Margaret P. Cameron, M.A. Little Brown and Company, 34 Beacon Street, Boston 6, Mass., 1962. 125 pages, $2.95.

This Ciba Symposium is a fitting, up-to-date successor to the Symposium on Drug-resistance in Microorganisms published in 1957. Sir Charles Harington, in whose honor this symposium was held, introduced the theme by comparing the status of the penicillins and penicillin-resistance five years ago and today. The remainder of the symposium consists of five papers on various aspects of the penicillins and their modes of action, resistance to the penicillins by means of penicillinase and drug indifference, and estimations of the risk concerning the development of resistance to the newer penicillinase-resistant penicillins.

This little book is perhaps of greatest interest to microbiologists and infectious disease specialists. Nevertheless, there are many discussions of interest to practicing physicians. These deal particularly with the manner in which the resistant staphylococcal problem arose in the first place, the role of isolation techniques, and the manner in which drug resistance occurs *in vivo*.

HAROLD J. SIMON, M.D.

* * *

CANCER OF THE STOMACH—William H. ReMine, M.D., M.S. in Surgery, F.A.C.S; Head of a Section of Surgery, Mayo Clinic; Assistant Professor of Surgery, Mayo Foundation, Graduate School, University of Minnesota; James T. Priestley, M.D., M.S. in Experimental Surgery, Ph.D. in Surgery, F.A.C.S.; Head of a Section of Surgery, Mayo Clinic; Professor of Surgery, Mayo Foundation, Graduate School, University of Minnesota; and Joseph Berkson, M.D., D.Sc.; Head of the Section of Biometry and Medical Statistics, Mayo Clinic; Professor of Biometry and Medical Statistics, Mayo Foundation, Graduate School, University of Minnesota; and Members of the Staff of the Mayo Clinic, Rochester, Minnesota. W. B. Saunders Company, Philadelphia and London, 1964. 255 pages, $11.50.

"Cancer of the Stomach" is compiled by three members and contributed to by eleven other members of the Mayo Clinic Staff, and represents a very complete and up to date evaluation of the subject of gastric malignancy.

Following a brief historical review of the surgical aspects, the problem of diagnosis is dealt with in considerable detail: the symptoms, the roentgenologic findings, and the value of gastroscopy and cytology and certain other laboratory studies. The surgical aspects are handled very completely: when to operate, the indication and technique of proximal and distal subtotal gastrectomy, total gastrectomy, and the value of various palliative procedures. The pathology of the various forms of gastric carcinoma and sarcoma are also very well presented and these aspects are carefully related to the clinical and surgical aspects as well as the prognosis. Statistical analyses are extensively employed with the liberal use of tables and charts, and they are helpful in arriving at certain basic principles regarding the management of neoplasms of the stomach. A chapter on anesthesia and one on postoperative care are interesting but quite general and in many ways off the basic subject, and so they tend to distract the reader from the main theme of the book.

The monograph draws heavily on the tremendous experience of the Mayo Clinic from 1907 through 1959 with particular emphasis on the cases handled during the 21 years from 1938 to 1959. It is not purely a report of their own findings for their views and conclusions are related to those of other workers in the field. Because a number of authors are writing on various aspects of the same general subject, there tends to be some repetition from one chapter to another, but this is not a serious drawback.

I believe this book is a valuable addition to the medical literature, and will serve as a useful guide to clinicians and pathologists in dealing with patients with cancer of the stomach.

JOHN M. ERSKINE, M.D.

* * *

HYPOXIA—Edward J. Van Liere, M.D., and J. Clifford Stickney. The University of Chicago Press, 5750 Ellis Avenue, Chicago 37, Ill., and London, 1963. 381 pages, $8.75.

This monograph begins with a brief historical outline, a physiologic classification and a review of the experimental methods used by various workers to produce hypoxia. Subsequent chapters describe the effects of hypoxia on blood, the cardiovascular system, respiration, the alimentary tract, secretion of urine, the endocrine glands, metabolism, heat regulation, water distribution, nutrition and the nervous system. Three chapters are devoted to mountain sickness, acclimatization and resistance to hypoxia. The text is documented by 1829 reference citations and supplemented by 11 tables and 11 figures.

Although this book summarizes the major research work on many aspects of hypoxia, it is not a comprehensive treatise. The authors review what is known and suggest many remaining problems which require further investigation. The text is well organized, clearly written and easy to read.

For the physician interested in the physiology of hypoxia, this monograph provides succinct summaries of its effects on various organ systems as well as a good reference source.

CHARLES T. CARMAN, M.D.

* * *

HISTOCHEMISTRY AND CYTOCHEMISTRY — Proceedings of the First International Congress, Paris, 1960—Edited by R. Wegmann. A Pergamon Press Book, distributed by the Macmillan Company, New York, pursuant to a special arrangement with Pergamon Press Limited, Oxford, England; 1963. 481 pages, $15.00.

This book contains timely reviews of important study areas in histochemistry.

Dr. Leblond's treatment of the uses of autoradiography includes the details of his methods, and very useful precautions based upon the long experience of his group. His statements about the quantitative potential of the method require qualifying comment, but the book contains no discussions from the meeting.

Barrnett and Tice review the development of electron microscope histochemistry in encyclopedic fashion, but again modify the coverage with good advice based upon their own experiments. Those interested in this vital topic will find a good beginning here.

The succeeding reviews by Seligman, Burstone and Novikoff give good accounts of the creation and validation of methods for the localization of enzymes. These discussions are limited to methods.

The reviews by several European authors and by Drs. Montagna and Ellis on the skin, are focused upon the application of special methods to problems in cancer, general cytology or other applied fields.

A major obstacle presented by the book is the transcription of the text in three languages. One wonders why the speakers were not persuaded to translate their papers into English to allow the book wider acceptance.

This is neither a major histochemical text nor a presentation of original work not to be found elsewhere, but it allows fuller discussion of some topics than the former, and more extensive review and background than the latter.

LLOYD SILVERMAN, M.D.

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Singoserp (syrosingopine): Use cautiously in patients with peptic ulcer. Discontinue several weeks prior to surgery, if possible.

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Esidrix (hydrochlorothiazide): Watch for signs of fluid or electrolyte imbalance. Further electrolyte depletion may cause hypochloremic alkalosis and hypokalemia. Since the latter may precipitate digitalis intoxication, watch carefully patients taking digitalis or its glycosides.

Pay special attention to electrolyte balance of patients with severe renal or hepatic insufficiency. In patients with cirrhosis and ascites, watch for symptoms of impending hepatic coma. Contraindicated in patients with oliguria and complete renal shutdown.

Rare reactions: purpura with or without thrombocytopenia, skin rash, photosensitivity, urticaria. Thiazides may decrease glucose tolerance; use cautiously in diabetics. Hyperuricemia may occur but is readily reversed by a uricosuric agent.

Occasional side effects: nitrogen retention (in hypertensive patients), nausea, anorexia, headache, restlessness, constipation.

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References

1. Kolodny, A. L., and Dabolins, R.: Angiology *11*:180 (June) 1960.
2. Bare, W. W.: J. Amer. Geriat. Soc. *8*:795 (Oct.) 1960.
3. Lisan, P., and Balaban, S. A.: J. Amer. Geriat. Soc. *8*:803 (Oct.) 1960.

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Crop Insecticide Hazard Termed Negligible

A chemical insecticide used to spray crops has only a negligible effect on persons living nearby, a study showed.

The study, made in the Phoenix area, compared city dwellers unexposed to insecticides with persons living less than 500 yards from sprayed fields who frequently complained about the insecticide, primarily because of the odor and nasal irritation, according to a report in the June 1 *Journal of the American Medical Association.* Most of the exposed group lived within 50 yards of the sprayed fields and probably had as much exposure as any individuals not occupationally involved with insecticides, it was pointed out.

Results of the study "support the conclusions of others that hazards of insecticidal poisoning to persons with environmental or incidental exposure are negligible," Robert S. Ganelin, M.D., Phoenix, Cipriano Cueto Jr., M.S., Atlanta, and G. Allen Mail, M.S., Tucson, concluded.

Agricultural insecticides are used in the Phoenix area most of the year with the heaviest applications to the cotton crop in July, August and September, the researchers explained. Parathion, an organic phosphorus insecticide, is used almost exclusively in the study area and it is generally applied by planes.

Nearby homes were frequently enveloped by drifting insecticide following applications, according to the report.

The high toxicity of some organic phosphorus insecticides is well known but proper safety precautions can eliminate danger to persons who work with them, the researchers said. With increasing use of these chemicals, they said, there has been growing concern about the possible hazard among unprotected persons, particularly in residential areas adjacent to treated crops.

A total of 122 volunteers was studied in an effort to determine absorption of the chemical, symptoms associated with insecticide poisoning, and laboratory evidence of chemical intoxication.

For comparison, the volunteers were divided into exposed, unexposed, and occupationally exposed groups and further subdivided into asthmatics and nonasthmatics. They were checked monthly from May through December, 1958.

Although the number complaining of symptoms was higher for the exposed groups, the differences were not significant for any month, it was found. Neither was there found a single individual with symptoms resembling those of organic phosphorus poisoning.

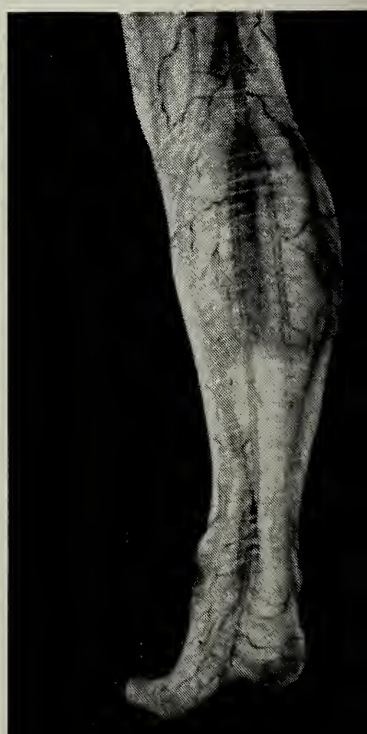
The differences in absorption between the city dwellers and those living near the treated fields were "small and not significant." Only one person,

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a farmer, produced laboratory evidence of intoxication and he had no symptoms of poisoning.

Evaluation of the effect of insecticides on asthma is much more difficult than evaluation of its effect as a poison, the authors pointed out.

Many of the exposed asthmatics maintained that their asthmatic attacks were related to insecticide exposure. The authors said the complexity and variability of the disease made it impossible to draw definitive conclusions but, if insecticides do affect pre-existing bronchial asthma, their findings indicate that the effect is a relatively minor one.

Valve and Part of Aorta Replaced In Same Operation

An operation in which a four-inch section of the aorta and a heart valve were removed and artificial replacements inserted was reported in the May 25 *Journal of the American Medical Association.*

The operation was described by Drs. Myron W. Wheat Jr., James R. Wilson and Thomas D. Bartley, Gainesville, Fla., who said there had been no previous report of a case in which the entire ascending aorta from where the artery enters the heart to the first branch was replaced as well as the aortic valve.

The operation was performed on a 57-year-old man on Dec. 7, 1962. About 11 months later, he was involved in a car accident and suffered "a severe crushing injury to the chest." However, the valve was not dislodged and he made a good recovery.

Thirteen months following surgery, he was "actively engaged in his occupation as a housepainter, climbing ladders to paint three-storied buildings without difficulty," the authors said.

Surgery was necessary because of a large aneurysm, or bulge, in the aorta, according to the report.

The involved segment of artery was replaced with a woven plastic tube one-fourth inch in diameter.

The coronary arteries which connect with this section of the aorta also had to be severed and sewn onto the artificial implant.

After the bulging artery was removed, it was apparent that a previously diagnosed deficiency of the aortic valve needed correction, and an artificial ball-valve was implanted.

During the operation, the work of the patient's heart and lungs was performed by a heart-lung machine and the patient's heart was cooled to 44 to 50 degrees Fahrenheit to quiet its beat. The operation lasted about three hours. The patient was discharged from the hospital 17 days later.

The authors are affiliated with the department of surgery, College of Medicine, University of Florida.



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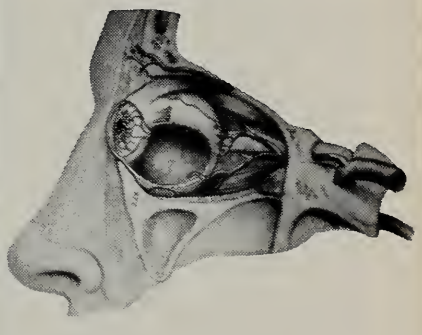
use with caution in the presence of a recent myocardial lesion, severe angina pectoris, and thyrotoxicosis.

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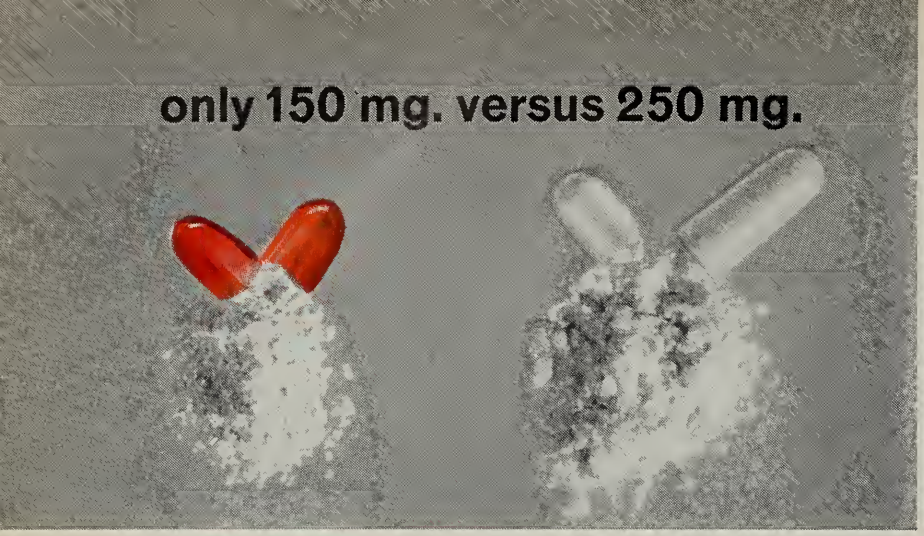
IN CIRCULATORY DISORDERS OF THE EYE

where there is vasospastic and circulatory impairment.

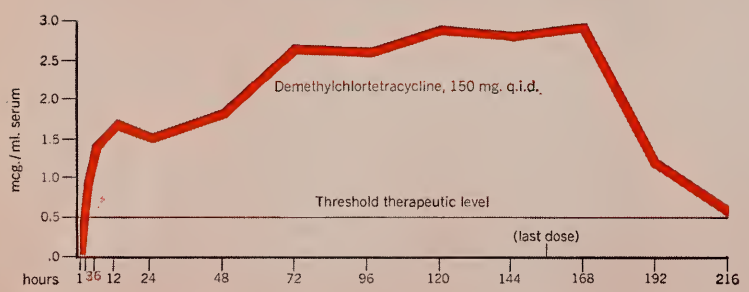
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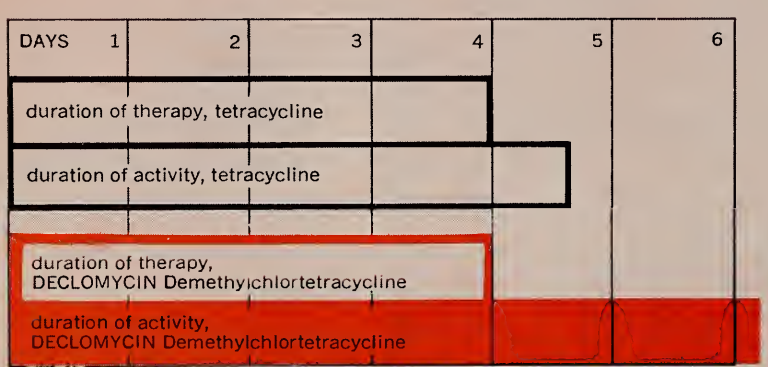


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From Sweeney, W. M.; Dornbush, A. C., and Hardy, S. M.: *Amer. J. Med. Sci.* 243:296 (Mar.) 1962.

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When vaginitis is a problem, there is increasing evidence in medical literature that an alkaline douche such as StomAseptine provides superior benefits.

In pruritus vulvae, Glynn[1] found "that an alkaline douche produced outstanding results in the relief of this vaginal itch....this can be attributed to the effective removal of leukorrheal secretions, which probably initiate and propagate the itch." Davis[2] had better success "with alkaline preparations... patients reported them more soothing than the previously used acid solutions." MacGuigan[3] recently reported that the alkaline douche is his method of choice in treating vaginal moniliasis. StomAseptine was found most satisfactory in relieving symptoms of vaginal irritation, soreness, and burning.

StomAseptine releases nascent oxygen which interferes with the growth of the essentially anaerobic *Trichomonas vaginalis,* making it more vulnerable to specific trichomonicidal agents.

Glynn[4] has found an alkaline douche to be more mucolytic and to provide more effective cleansing. Peel[5] has emphasized the value of alkaline douches in removing the highly acid discharge associated with *Trichomonas* and *Monilia* vaginitis.

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References: 1. Glynn, R.: Obst. & Gynec. 20:369 (Sept.) 1962; 2. Davis, C. H.: J.A.M.A. 157:126 (Jan. 8) 1955; 3. MacGuigan, J. F.: Personal Communication, Nov. 1, 1963; 4. Glynn, R.: Obst. & Gynec. 22:640 (Nov.) 1963; 5. Peel, J. H.: Textbook of Gynecology, 5th Ed., London, Wm. Heineman, 1958, p. 383.

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BOOKS RECEIVED

Books received by CALIFORNIA MEDICINE *are acknowledged in this column. Selections will be made for more extensive review in the interest of readers as space permits.*

ADOLESCENT IN PSYCHOTHERAPY — Donald J. Holmes, M.D., Associate Professor of Psychiatry, University of Michigan Medical School. With a Foreword by Raymond W. Waggoner, M.D., Sc.D., Chairman, Department of Psychiatry; Director of the Neuropsychiatric Institute, University of Michigan Medical School. Little, Brown and Company, Boston, Mass., 1964. 337 pages, $9.50.

ALLERGY AND HYPERSENSITIVITY—A Programmed Review for Physicians—Second Edition, Revised. Developed by Basic Systems, Inc., in collaboration with Pfizer Laboratories' SPECTRUM. Produced for the medical profession and distributed as an educational service by Pfizer Laboratories, Div., Chas. Pfizer & Co., Inc., 235 East 42nd St., New York 17, N.Y., 1964. 94 pages, paperbound. (No price quoted.)

ANNUAL REVIEW OF MEDICINE—Volume 15—Arthur C. Degraff, Editor, New York University College of Medicine; and William P. Creger, Associate Editor, Stanford University School of Medicine. Annual Reviews, Inc., Palo Alto, California, U.S.A., 1964. All publications of Annual Reviews, Inc., a non-profit corporation, sell for $8.50 per copy, postpaid (U.S.A.), $9.00 postpaid (elsewhere).

BIOSTATISTICS—An Introductory Text—Avram Goldstein, Professor of Pharmacology, Stanford University, Palo Alto, California. The Macmillan Company, New York (Collier-Macmillan Limited, London), 1964. 272 pages, $9.50.

COLUMBIA-PRESBYTERIAN THERAPEUTIC TALKS —Topics in Medicine for the Internist and General Physician—Volume Two, edited by Hamilton Southworth, M.D., and Frederick G. Hofmann, Ph.D., College of Physicians & Surgeons, Columbia University, and Columbia-Presbyterian Medical Center, New York City. The Macmillan Company, New York, and Collier-Macmillan Limited, London, 1964. 220 pages, $7.00.

COMMON COMPLAINTS: Consultations in Medicine—A Collection of Medical Articles from Consultant Magazine. Smith, Kline & French Laboratories, Philadelphia, 1964. Offered to physicians for a price of $3.00. 206 pages.

CRYSTAL ARROW, THE—Essays on Literature, Travel, Art, Love, and the History of Medicine—Felix Marti-Ibanez, M.D., Editor-in-Chief of the Medical Newsmagazines, MD, MD of Canada, and MD en Espanol; former Professor and Chairman of the Department of the History of Medicine, New York Medical College. Clarkson N. Potter, Inc., Publisher, New York, 1964. 712 pages, $6.00.

CURRENT PSYCHIATRIC THERAPIES—An Annual Publication—Volume IV, 1964—edited by Jules Masserman, M.D., Professor and Co-chairman of Psychiatry, Northwestern University, Chicago, Illinois. Grune & Stratton, Inc., 381 Park Avenue South, New York, N. Y., 1964 315 pages, $9.75.

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NEW BOOK

CURRENT DIAGNOSIS AND TREATMENT, 1964. By Henry Brainerd, M.D., Sheldon Margen, M.D., and Milton J. Chatton, M.D. 870 pages. 1964. Lange. $9.50.

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FUNDAMENTALS OF OTOLARYNGOLOGY—A Textbook of Ear, Nose and Throat Disease—Fourth Edition, Illustrated—Lawrence R. Boies, M.A., M.D., Professor of Otolaryngology, Chairman, Department of Otolaryngology; Jerome A. Hilger, M.D., M.S., Clinical Professor of Otolaryngology; and Robert E. Priest, M.D., M.S., Clinical Professor of Otolaryngology, all of the University of Minnesota Medical School. W. B. Saunders Company, Philadelphia and London, 1964. 553 pages, $8.50.

HUMAN REPRODUCTION AND SEXUAL BEHAVIOR —edited by Charles W. Lloyd, M.D., Worcester Foundation for Experimental Biology, Shrewsbury, Massachusetts. Lea & Febiger, Philadelphia, 1964. 564 pages, $12.50.

MARRIAGE COUNSELING IN MEDICAL PRACTICE— A Symposium—edited by Ethel M. Nash, M.A., Lucie Jessner, M.D., and D. Wilfred Abse, M.D. The University of North Carolina Press, Chapel Hill, 1964. 368 pages, $8.00.

MODERN TREATMENT—Volume 1, Number 1, January 1964. Treatment of Renal Disease by E. Lovell Becker, M.D., Guest Editor; Treatment of Thyroid Disease, by Edward A. Carr, Jr., M.D., Guest Editor. Harper & Row, Publishers (Hoeber Medical Division), New York, 1964. Bimonthly publication, by subscription only; 6 books a year; $16.00 per year (laminated paperback); 228 pages.

MONOGRAPHS IN THE SURGICAL SCIENCES — A Quarterly—Volume I, March, 1964—Number 1. Surgical Sciences is published four times a year in March, June, September, and December, and the four issues are the annual volume. The Williams & Wilkins Company, Baltimore 2, Md., publishers.

MYTHS OF MADNESS—New Facts for Old Fallacies— Don D. Jackson, M.D., The Macmillan Company, New York, 1964. 178 pages, $4.50.

NECK AND ARM PAIN—Rene Cailliet, M.D., Chief of Department of Physical Medicine, Southern California Permanente Medical Group; Associate Clinical Professor, University of Southern California School of Medicine, Department of Physical Medicine and Rehabilitation; Department Head, Physical Medicine, Kaiser Foundation Hospitals, Southern California. F. A. Davis Company, Philadelphia, Pa., 1964. 112 pages, $3.00 (Paperback).

NEW DIMENSIONS IN PSYCHOSOMATIC MEDICINE —edited by Charles William Wahl, M.D., Associate Professor of Psychiatry and Chief, Division of Psychosomatic Medicine, Department of Psychiatry, Center for The Health Sciences, University of California at Los Angeles; with 13 authors. Little, Brown and Company, Boston, 1964. 340 pages, $8.50.

NEW AND NONOFFICIAL DRUGS—An Annual Compilation of Available Information on Drugs, Including Their Therapeutic, Prophylactic and Diagnostic Status, As Evaluated by the Council on Drugs of the American Medical Association—1964. J. B. Lippincott Company, Philadelphia and Montreal, 1964. 863 pages, $4.75.

OCCUPATIONAL DISEASE IN CALIFORNIA ATTRIBUTED TO PESTICIDES AND OTHER AGRICULTURAL CHEMICALS, 1962—State of California, Dept. of Public Health, Bureau of Occupational Health, 2151 Berkeley Way, Berkeley 4, Calif. Copies are available free upon request as long as the supply lasts from the Bureau of Health Education, California State Department of Public Health, 2151 Berkeley Way, Berkeley 4, Calif.

SURGICAL CLINICOPATHOLOGICAL CONFERENCES OF THE MASSACHUSETTS GENERAL HOSPITAL— Benjamin Castleman, M.D., Chief, James Homer Wright Pathology Laboratories, Massachusetts General Hospital; Professor of Pathology, Harvard Medical School; and John F. Burke, M.D., Assistant in Surgery, Massachusetts General Hospital; Instructor in Surgery, Harvard Medical School. Little, Brown and Company, Boston, 1964. 249 pages, $12.50.

TEXBOOK OF OTOLARYNGOLOGY—Second Edition— David D. DeWeese, M.D., Professor and Chairman of the Department of Otolaryngology, University of Oregon Medical School, Portland, Ore.; and William H. Saunders, M.D., Professor and Chairman of the Department of Otolaryngology, The Ohio State University College of Medicine, Columbus, Ohio. The C. V. Mosby Company, St. Louis, 1964. 523 pages, $9.25.

THIRST—Proceedings of the First International Symposium on Thirst in the Regulation of Body Water Held at the Florida State University in Tallahassee, May 1963. Edited by Matthew J. Wayner, Syracuse University. A Pergamon Press Book, distributed by the Macmillan Company, New York, 1964. 570 pages, $20.00.



B. B., Age 10—atopic dermatitis all her life...and after two weeks of treatment.

Case History: B. B. is a 10-year old girl with a life-long history of atopic dermatitis. Previous diet therapy, lamp treatment, and antihistamine were of no avail. First photograph shows a severely excoriated, eczematized area with intractable pruritus. ARISTOCORT® Triamcinolone Acetonide 0.1% Cream was prescribed, and relief was obtained in 24 hours. Follow-up photo was taken two weeks later.

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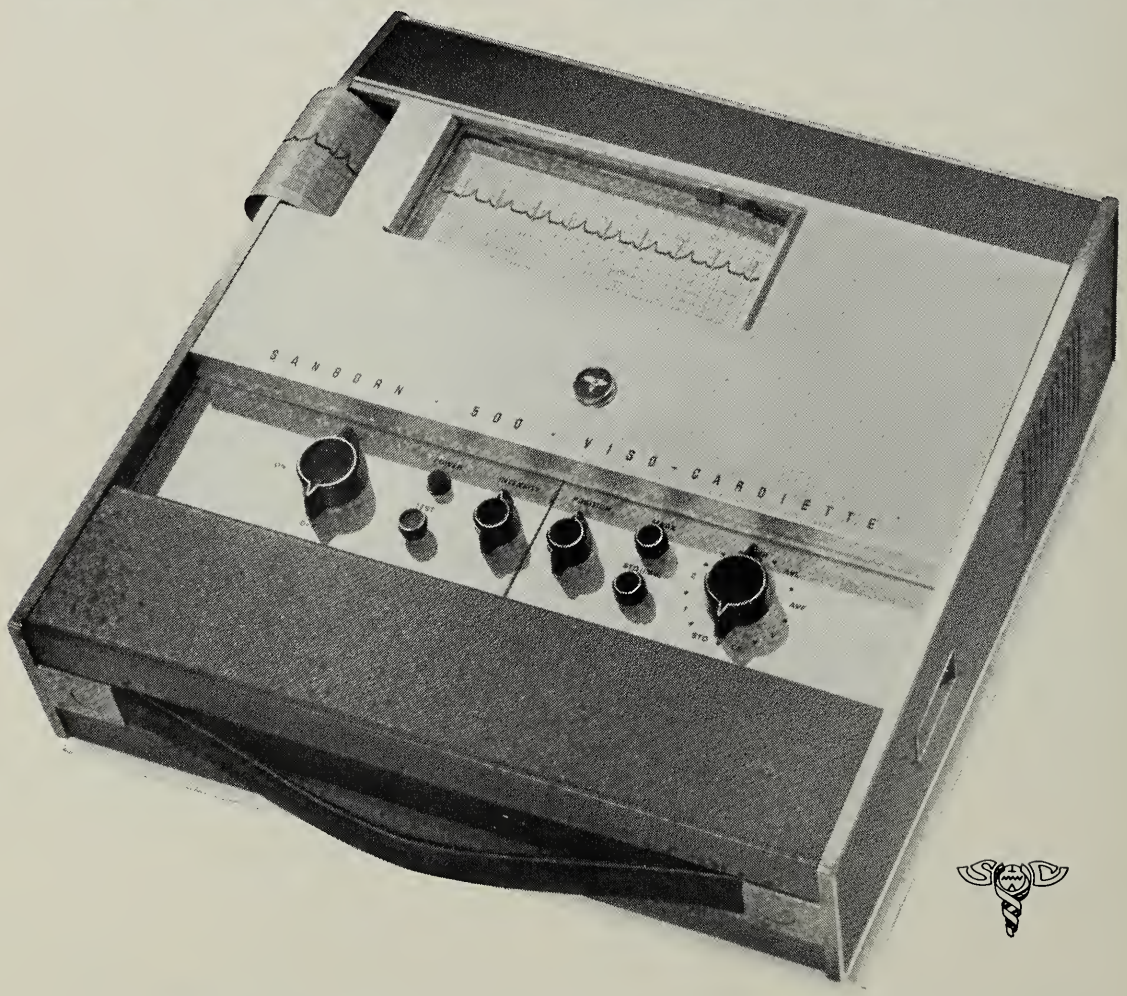
In systole and diastole, the human heart produces a maximum signal of only a few millivolts between two ECG limb electrodes. Mixed in with this tiny signal may be some unwanted electrical "noise", caused by power lines, nearby X-ray or diathermy machines, or even ordinary office equipment. Until now, eliminating this noise from the record usually meant time-consuming adjustments and rerunning records until the complexes were clear.

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Clinics (U.S.A.)	9	1,899	14,821	3.6	26.0	0
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Published Data on Frequency of Side Effects Occurring with Norethindrone 2 mg. with Mestranol 0.1 mg.
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Compound	Dose	No. of Patients	No. of Cycles	BTB and Spotting	Amenorrhea	Nausea
Norethindrone with mestranol[2-5]	2 mg. 0.1 mg.	706	6,061	2.6%	0.1%*	0.89%

*Author (5) does not present incidence of amenorrhea.

References: 1. Goldzieher, J. W., Moses, L. E., and Ellis, L. T.: J.A.M.A. 180:359 (May 5) 1962. **2.** Wearing, M. P.: Canad. M.A.J. 89:239 (Aug. 10) 1963. **3.** Ringrose, C. A. D.: Canad. M.A.J. 89:246 (Aug. 10) 1963. **4.** Hutcherson, W. P., Schwartz, H. A., and Smith, L.: Southern M. J. 56:1357 (Dec.) 1963. **5.** Tyler, E. T.: J.A.M.A. 187:562 (Feb. 22) 1964.

Contraindications: Thrombophlebitis or pulmonary embolism (current or past); cardiac, renal or hepatic dysfunction; carcinoma of the breast or genital tract; severe depression.

Precautions: Existing uterine fibroids may increase in size. In lactating mothers delay Norinyl until nursing needs are established. Withhold Norinyl before liver or endocrine function testing. In metabolic or endocrine disorders careful clinical preevaluation of patients is indicated. Because progestational agents with estrogen in general may cause some degree of fluid retention, patients with a history of epilepsy, migraine and asthma require careful observation.

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*First synthesized by Syntex Laboratories (Djerassi, et al.: Paper presented before the Division of Medicinal Chemistry, American Chemical Society meeting, Milwaukee, Wisconsin, April 3, 1952.)

Human Pesticide Storage Not Increasing

Retention of ingested pesticides in the general population has not increased since 1951, a study showed.

To investigate the nature and extent of the storage of chlorinated pesticides in human fat, Drs. William S. Hoffman, William I. Fishbein and Morten B. Andelman, Chicago, analyzed fat specimens obtained at autopsy from 282 persons.

Traces of pesticides on vegetables, fruits, and forage material may be eaten either directly by man or by animals that are in turn consumed by man, the researchers wrote in the June 1 *Journal of the American Medical Association.*

Since chlorine-containing pesticides were more likely to be retained in human fat, about 20 were extracted and analyzed, they explained. However, only two, lindane and DDT, were found consistently in the samples, they reported.

"The most significant feature of these analytical results is that they indicate that there has been no progression of storage of DDT in the general population since the first studies . . . in 1951," they said.

"The data tend to confirm the theory that for any chronic intake level of DDT, equilibrium between intake of DDT and excretion of the sum of its metabolic derivatives is eventually achieved, after which the concentration of total DDT in the fat tends to remain constant."

The median level of DDT in the later study, conducted in 1963, is lower than the median level found in the 1951 study, according to the report. On the average, 72 per cent of the total DDT-derived material found in the fat was in the form of a DDT derivative called DDE, which is much less toxic than DDT itself, it was pointed out.

Though lindane was found in all but 5 of the 282 samples, the levels were much lower than those of DDT.

Sixty-four samples were analyzed for dieldrin and endrin, two other pesticides. No trace of endrin was found. Dieldrin was found in small amounts in only 29 of the 64.

Human intake via the common foods has been estimated to be about 0.184 milligram per day, the researchers said, adding:

"At this intake equilibrium has apparently been reached long ago, so that the concentration of DDT in the fat in the general population has not increased in the last 12 years.

"Apparently also, the intake of lindane, dieldrin, and other pesticides is so low and/or the rate of excretion is so rapid, that the fat levels of these pesticides is either insignificant when measurable, or not even measurable by the most refined methods now available."

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For example, Norgesic produced satisfactory relief of pain in 69% of patients with osteoarthritis (a highly significant figure when compared to 50-55% efficacy with salicylates alone, as reported by Batterman)*.

Norgesic compared with both Codeine-APC and Propoxyphene Compound. In another study,† Norgesic proved more effective than Codeine-APC and equal to the propoxyphene compound. Documentation of these open studies and data from other clinical studies available on request.

INDICATIONS: Symptomatic relief of mild to moderate pain associated with: Acute sprains, strains and contusions • Fractures and dislocations • Myositis, Myalgia • Osteoarthritis • Bursitis, shoulder syndrome and neuritis • Tension headache • Whiplash • Torticollis • Intervertebral disc syndrome • Chronic back syndrome and chronic cervical spasm • Muscular aches of infections and of non-specific origin • **CONTRAINDICATIONS:** Norgesic should not be used in patients with glaucoma, pyloric or duodenal obstruction, stenosing peptic ulcers, prostatic hypertrophy or obstructions at the bladder neck and cardiospasm (megaesophagus) due to mild anticholinergic effect of orphenadrine citrate. Norgesic is also contraindicated in patients with myasthenia gravis and in patients known to be sensitive to aspirin, phenacetin or caffeine. **WARNING:** Since mental confusion, anxiety and tremors have been reported in patients receiving orphenadrine and propoxyphene concurrently, it is not recommended that Norgesic be given in combination with propoxyphene. **PRECAUTIONS:** Recent studies have indicated that prolonged excessive use of phenacetin may result in nephrotoxicity. Caution should therefore be exercised when administering Norgesic to patients with renal insufficiency. It should also be used with caution in patients with tachycardia. Norgesic is not recommended for use in children under 6 years of age since it has not been studied in this age group. **SIDE EFFECTS:** Side effects of Norgesic are those seen with APC or those usually associated with mild anticholinergic agents. These may include tachycardia, palpitation, urinary hesitancy or retention, dry mouth, blurred vision, dilation of the pupil, increased ocular tension, weakness, nausea, vomiting, headache, dizziness, constipation and drowsiness. Infrequently, an elderly patient may experience some degree of confusion. Mild central excitation and occasional hallucinations may be observed. These mild side effects can usually be eliminated by reduction in dosage. **DOSAGE:** Adults—1 to 2 tablets 3 to 4 times daily. Children (acute use only)—6 to 12 years of age, 1 tablet 3 to 4 times daily. **AVAILABILITY:** Bottles of 100 tablets. **CAUTION:** Federal law prohibits dispensing without prescription.

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*Batterman, R. C., Mouratoff, G. J., and Kaufman, J. R.: Current Therapeutic Research 4-81-88 (March) 1962.
†Cass, L. J. and Frederik, W. S.: To be published.



REFERENCES AND REVIEWS

HAZARDS FROM EQUIPMENT CONTAMINATED WITH PARATHION—R. S. Ganelin (4402 N. Seventh St., Phoenix, Ariz.), G. A. Mail, and C. Cueto, Jr. Arch. Environ. Health, 8:826 (June) 1964.

Three cases of organophosphorus poisoning, in which the source of exposure precipitating the illnesses appeared to be airplanes contaminated with insecticides, were seen in a period of three weeks. This experience emphasizes the fact that all equipment used for application or handling of toxic insecticides, particularly the relatively stable ones such as parathion, should be considered dangerous until thorough decontamination procedures have been carried out.

* * *

PSYCHOTHERAPY RESEARCH: DILEMMAS AND DIRECTIONS—C. H. Ward (3400 Spruce St., Philadelphia). Arch. Gen. Psychiat., 10:596 (June) 1964.

An overview critique of present psychotherapy research defines three main problems: professional inertia (avoidance, constriction, distortion), need for focus (on the most relevant criterion-outcome), and economy (especially of time). The argument is developed in favor of a retrospective approach with an intensive analysis of former patients, treated by outstanding representatives of the various "schools" of psychotherapy. Ideas for preserving anonymity of the patient and the therapist and for obtaining undistorted data are presented. This approach has been insufficiently explored and holds promise for releasing us from the confinement of inadequate sampling and the overwhelming data mass which characterize the now emphasized microscopic-ongoing studies.

* * *

CORTISOL SECRETION RATE IN DEPRESSIVE ILLNESS—J. L. Gibbons (Royal Victoria Infirmary, Newcastle Upon Tyne, England). Arch. Gen. Psychiat., 10:572 (June) 1964.

The secretion rate of hydrocortisone (Cortisol) was measured by the isotope dilution technique in 15 depressed patients and repeated in 14 of them after recovery or major improvement. The mean pre-treatment rate was 26.1 ± 2.3 mg per 24 hours. In seven severely depressed patients, the mean secretion rate was 33.0 mg, and 20.0 mg in eight moderately depressed. After recovery, the mean rate was 14.0 ± 0.9 mg. In ten patients, relief of depression was accompanied by a significant decrease in the secretion rate of hydrocortisone. In the remainder, there was no change.

* * *

ATMOSPHERIC IONIZATION IN ALLERGIC DISEASES—G. I. Blumstein, J. Spiegelman (Old York Rd. and Township Line, Jenkintown, Pa.), and P. Kimbel. Arch. Environ. Health, 8:818 (June) 1964.

Using a double-blind technique, 26 patients with allergic diseases of the respiratory tract were studied by clinical evaluation and a battery of pulmonary function tests before and after exposure to a course of positive, negative, and neutral atmospheric ions. No significant changes in these patients were observed, either clinically or after evaluation by objective pulmonary function tests, regardless of the therapeutic modality used. These findings suggest that atmospheric ionization has no place in the treatment of allergic disease of the respiratory tract.

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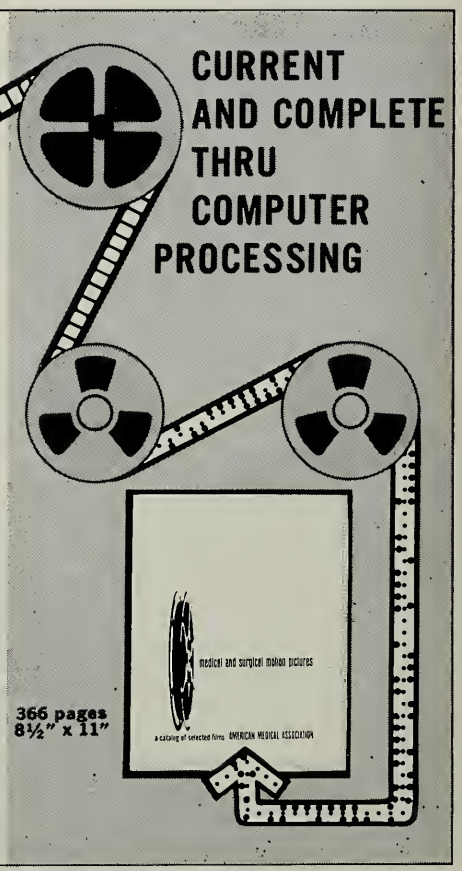
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(Continued on Page 58)

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(Continued from Page 57)

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Statistics Reveal No Epidemics Of Spinal Defect

Statistics gathered over a 17-year period offer no proof that a congenital abnormality of the spinal cord has occurred in epidemics, Drs. Gilbert W. Mellin and Michael Katzenstein, New York City, reported.

Fluctuations in the occurrence of the defect, termed meningomyelocele, from 1946 through 1962 "are well within the range of chance and do not necessarily indicate the presence of epidemics," the two physicians wrote in the February 22 *Journal of the American Medical Association.*

Their conclusion was based on 15,333 deliveries analyzed by the Fetal Life Study, an epidemiological investigation of prenatal influences and survival. They placed the normal incidence of the defect at roughly 1 per 1,000 births.

The article was prompted by a previous JAMA report of the births of 16 infants with this defect during a three-month period in Atlanta in 1962, which appeared to be more than a chance occurrence.

Meningomyelocele is a bulge in part of the spinal cord and its covering membrane due to defective closure of the vertebrae. The symptoms may be mild but can cause paralysis of the legs and lower part of the body.

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Leon R. Rudnick.....Secretary
15921 East 14th Street, San Leandro 94578

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Los Angeles 90057

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2243 Van Ness Avenue, San Francisco 94109
David C. Monsen.....Secretary
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San Francisco 94110
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South Bascom Avenue, San Jose 95128

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Byron O. Mork.....Vice-Chairman
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George Y. Abe.....Vice-Chairman
Metropolitan State Hospital, Norwalk 90650
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700 Medico-Dental Building, San Jose 95113

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Los Angeles 90027
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St. Mary's Hospital, 2200 Hayes Street,
San Francisco 94117
Victor G. Mikity.....Secretary
1200 North State Street, Los Angeles 90033

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Dwight L. Wilbur, San Francisco	(1963-1964)	Francis J. Cox, San Francisco
J. Norman O'Neill, Los Angeles	(1963-1964)	William F. Quinn, Los Angeles
J. Lafe Ludwig, Los Angeles	(1963-1964)	Harold Kay, Oakland
Burt L. Davis, Palo Alto	(1963-1964)	Leon P. Fox, San Jose
Arlo A. Morrison, Ventura	(1963-1964)	John G. Morrison, San Leandro
James E. Feldmayer, Exeter	(1963-1964)	Charles Grayson, Sacramento
O. W. Wheeler, Riverside	(1963-1964)	Wilbur Bailey, Los Angeles
Malcolm C. Todd, Long Beach	(1963-1964)	Alfred J. Murieta, Jr., Los Angeles
J. E. Vaughan, Bakersfield	(1963-1964)	Joseph P. O'Connor, Pasadena
Samuel R. Sherman, San Francisco	(1964-1965)	Albert G. Miller, San Mateo
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Warren L. Bostick, San Rafael	(1964-1965)	Walter H. Brignoli, St. Helena
J. B. Price, Santa Ana	(1964-1965)	Donald C. Dodds, Oakland
Ralph C. Teall, Sacramento	(1964-1965)	Robb Smith, Orange Cove
James C. Doyle, Beverly Hills	(1964-1965)	Homer C. Pheasant, Los Angeles
Wilbur G. Rogers, Glendale	(1964-1965)	Carl M. Hadley, San Bernardino
Charles B. Hudson, Oakland	(1964-1965)	Robert L. Watson, Jr., Los Angeles

(Delegates and Alternates to the A. M. A. are elected for terms of two calendar years. Each office is scheduled for election at the Annual Session of the second year shown above.)

Other Organizations and Medical Schools

Board of Medical Examiners of the State of California

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213 731-6397

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Director.....Malcolm H. Merrill, M.D.
2151 Berkeley Way, Berkeley 94704
Berkeley.....2151 Berkeley Way 94704
415 843-7900
Sacramento.....631 J Street 95814
916 442-4711
Los Angeles.....703 State Building 90012
213 620-2900

Medical Schools in California

University of California School of Medicine, Medical Center, San Francisco 94122. Dean: William O. Reinhardt, M.D.

Stanford University School of Medicine, 300 Pasteur Drive, Palo Alto 94304. Acting Dean: Sidney Raffel, M.D.

University of Southern California School of Medicine, 2025 Zonal Avenue, Los Angeles 90033. Dean: Clayton G. Loosli, M.D.

Loma Linda University, School of Medicine, 1720 Brooklyn Avenue, Los Angeles 90033. Dean: David Burdg Hinshaw, M.D.

University of California at Los Angeles, School of Medicine, Hilgard Avenue, Los Angeles 90024. Dean: Sherman M. Mellinkoff, M.D.

California College of Medicine: 1721 Griffin Avenue, Los Angeles 90031. Dean: Warren L. Bostick, M.D.

Roster — CALIFORNIA COMPONENT MEDICAL SOCIETIES

Society secretaries are requested to notify California Medicine promptly when changes are indicated in their roster information

ALAMEDA-CONTRA COSTA Medical Assn., 6230 Claremont Ave., Oakland 94618. Meets quarterly.
Paul H. Cronenwett.....President
6230 Claremont Ave., Oakland 94618
J. Brandon Bassett.....Secretary
2930 McClure St., Oakland 94609

BUTTE-GLENN Medical Society, P. O. Box 1008, Chico 95927. Meets Fourth Thursday.
Jay O. Gibson.....President
170 E. 2nd Ave., Chico 95926
Dale W. Ritter.....Secretary
6 Cohasset Circle, Chico 95926

FORTY FIRST Medical Society, 4775 Santa Monica Blvd., Los Angeles 90029.
Loron N. McGillis.....President
11230 Magnolia Blvd., No. Hollywood 91601
Glenn F. Gordon.....Secretary
1630 Del Valle Ave., Glendale 91208

FRESNO County Medical Society, 2155 Amador, Fresno 93721. Meets Second Tuesday, 6:30 p.m., Sunnyside Country Club.
Norman E. Tostenson.....President
1223 Wishon Ave., Fresno 93728
Joseph B. Ford, Jr. Secretary
2940 Fresno St., Fresno 93721

HUMBOLDT-DEL NORTE County Medical Society. Meets Second Thursday.
Robert Devine.....President
730 7th St., Eureka 95501
Wells Carey.....Secretary
2822 E St., Eureka 95501

IMPERIAL County Medical Society. Meets Second Tuesday, 8 p.m., Pioneer Memorial Hospital, Brawley.
Nathan Wolf.....President
126 Main St., Brawley 92227
Ernest Brock Secretary
200 S. Imperial Ave., Imperial 92251

INYO-MONO County Medical Society. Meets Fourth Tuesday except December, January, February.
D. L. Christenson.....President
380 N. Mt. Whitney Dr., Lone Pine 93545
W. Ray Hartwig.....Secretary
459 West Line, Bishop 93514

KERN County Medical Society, 2603 G Street, Bakersfield 93301. Meets Third Tuesday, 7:30 p.m., Society Office, 2603 G Street, except June, July, August.
Hans E. Einstein.....President
2441 "G" St., Bakersfield 93301
Keith W. Spaulding.....Secretary
2521 "G" St., Bakersfield 93301

KINGS County Medical Society. Meets Second Thursday, 7:00 p.m. Place to be announced.
Clyde Ball.....President
1320 Whitley Ave., Corcoran 93212
Edwin E. Kerr.....Secretary
208 N. Douty St., Hanford 93230

LASSEN-PLUMAS-MODOC-SIERRA County Medical Society. Meets on call.
Lloyd Shannon.....President
P. O. Box 963, Alturas 96101
Robert C. Haggard.....Secretary
Box 426, Loyalton 96118

LOS ANGELES County Medical Assn., 1925 Wilshire Blvd., Los Angeles 90057.
Elmer F. Gooel.....President
1925 Wilshire Blvd., Los Angeles 90057
George C. Andersen.....Secretary
1925 Wilshire Blvd., Los Angeles 90057

MARIN Medical Society, 1601 Second St., Suite 106, San Rafael 94901. Meets First Thursday, 7:00 p.m.
Calvin Plumhof.....President
711 D St., San Rafael 94901
John McGee Secretary
712 D St., San Rafael 94901

MENDOCINO-LAKE County Medical Society.
Thomas Nicholson.....President
408 W. Perkins St., Ukiah 95482
Patrick R. Allanson.....Secretary
728 S. State St., Ukiah 95482

MERCED County Medical Society. Meets Fourth Thursday, Hotel Tioga, Merced.
James A. Parker.....President
535 W. 26th St., Merced 95340
Patrick J. Maloney.....Secretary
656 W. 20th St., Merced 95340

MONTEREY County Medical Society, P. O. Box 308, Salinas 93903. Meets First Thursday.
Osman H. Hull.....President
716 Cass St., Monterey 93940
Joseph E. Turner.....Secretary
1073 Cass St., Monterey 93940

NAPA County Medical Society. Meets Second Wednesday, P. O. Box 658, Napa 94559
E. Paul White, Jr. President
P. O. Box 658, Napa 94559
Richard Clark.....Secretary
1054 Beard Rd., Napa 94558

ORANGE County Medical Association, 300 S. Flower, Orange 92666. Meets First Tuesday, 7:00 p.m.
Hugh J. Plumb, Jr. President
1901 Westcliff Dr., Newport Beach 92663
Laurance A. Mosier.....Secretary
10510 Chapman St., Garden Grove 92640

PLACER-NEVADA County Medical Society. Meets Second Wednesday.
Clifford W. Wauters.....President
701 High St., Auburn 95603
Arthur R. Weaver.....Secretary
701 High St., Auburn 95603

RIVERSIDE County Medical Association, 4175 Brockton Ave., Riverside 92501. Meets Second Monday, 7:30 p.m., Spanish Arts Gallery, Mission Inn.
Donald P. Carpenter.....President
3660 Arlington Ave., Riverside 92506
Richard W. Trotter.....Secretary
6876 Magnolia Ave., Riverside 92506

SACRAMENTO Society for Medical Improvement, 5380 Elvas Ave., Sacramento 95819. Meets Third Tuesday, 8:30 p.m., Sutter Hospital Auditorium.
L. Morgan Boyers.....President
2615 Eye St., Sacramento 95816
James W. Martin.....Secretary
2811 L Street, Sacramento 95816

SAN BENITO County Medical Society. Meets once a month, except July and August. Time and place to be announced.
Kent S. Taylor.....President
345 5th St., Hollister 95023
Robert D. Quinn.....Secretary
535 Monterey St., Hollister 95023

SAN BERNARDINO County Medical Society, 1875 N. D St., San Bernardino 92405. Meets First Tuesday, 7:30 p.m., Harold's Club, Fontana.
Merlin A. Hendrickson.....President
238 N. Riverside Ave., Rialto 92376
Nicholas P. Krikes.....Secretary
25060 Base Line, San Bernardino 92410

SAN DIEGO County Medical Society, 3427 - 4th Ave., San Diego 92103. Meets Second Tuesday. Location of meetings varies.
Walter R. Nickel.....President
233 A St., San Diego 92101
Purvis L. Martin.....Secretary
2105 5th Ave., San Diego 92101

SAN FRANCISCO Medical Society, 250 Masonic Ave., San Francisco 94118.
John B. Schaupp.....President
250 Masonic Ave., San Francisco 94118
George K. Herzog, Jr.....Secretary
250 Masonic Ave., San Francisco 94118

SAN JOAQUIN County Medical Society. Meets First Thursday, 8:15 p.m., 445 W. Acacia St., P. O. Box 230, Stockton 95201.
James J. Benn, Jr.....President
P.O. Box 230, Stockton 95201
Dora A. Lee.....Secretary
2420 N. California St., Stockton 95204

SAN LUIS OBISPO County Medical Society. Meets Third Saturday, 7:00 p.m., Anderson Hotel, San Luis Obispo 93402.
Richard W. Eells.....President
743 Pismo St., San Luis Obispo 93401
Richard W. Cletsoway.....Secretary
705 Grand Ave., San Luis Obispo 93402

SAN MATEO County Medical Society, 122 El Camino Real, San Mateo 94401. Meets Third Tuesday.
Ward L. Hart.....President
100 Laurel Ave., San Carlos 94401
Howard W. Lindsey.....Secretary
323 N. San Mateo Dr., San Mateo 94401

SANTA BARBARA County Medical Society, 300 W. Pueblo St., Santa Barbara 93105. Meets Second Monday of the month, University Club, 1332 Santa Barbara St., Santa Barbara.
H. L. Stewart, Jr.....President
300 W. Pueblo St., Santa Barbara 93105
Thurman K. Hill.....Secretary
300 W. Pueblo St., Santa Barbara 93105

SANTA CLARA County Medical Society, 700 Empey Way, San Jose 95128. Meets First Monday.
S. Fred Kaufman.....President
700 Empey Way, San Jose 95128
Jacob M. Stone.....Secretary
700 Empey Way, San Jose 95128

SANTA CRUZ County Medical Society. Meets every Second Month, Second Tuesday. Time, place to be announced.
F. H. Koepke.....President
850 Main St., Watsonville 95076
John W. Morris.....Secretary
230 Walnut Ave., Santa Cruz 95060

SHASTA-TRINITY County Medical Society. Meets Second Monday of the month. Place to be announced.
Michael J. Hamilton.....President
1348 Market St., Redding 96001
Robert G. Taylor.....Secretary
1308 Court St., Redding 96001

SISKIYOU County Medical Society. Meets Sunday on call.
William D. Schnack.....President
8 Main St., Weed 94096
Rand Apgood.....Secretary
Medical Center Building, Yreka 96097

SOLANO County Medical Society. Meets Second Tuesday, 8:00 p.m., at different meeting places.
R. Matthew Gibbons.....President
1200 Marin St., Vallejo 94590
John C. Miller.....Secretary
410 Tennessee St., Vallejo 94590

SONOMA County Medical Society, 576 B Street, Santa Rosa 95401. Meets Second Thursday.
A. A. Thurlow, Jr. President
185 Sotoyome St., Santa Rosa 95405
Tetsuro Fujii.....Secretary
1667 Bloomfield Rd., Sebastopol 95472

STANISLAUS County Medical Society, 303 Downey Ave., Modesto. Meets Third Tuesday of the month, 7 p.m., Hotel Covell, Modesto 95354.
John S. Woolley.....President
808 13th St., Modesto 95354
Jeanne I. Miller.....Secretary
709 - 18th St., Modesto 95354

TEHAMA County Medical Society. Meets at call of President.
Harve Jourdan President
343 Oak St., Red Bluff 96080
William L. Weirich.....Secretary
210 S. Main St., Red Bluff 96080

TULARE County Medical Society, 1640 West Mineral King, P. O. Box 16, Visalia 93278.
James W. Goettle.....President
424 E. Tulare Ave., Tulare 93274
Philip S. Barber.....Secretary
P. O. Box 16, Visalia 93278

VENTURA County Medical Society. Meets Second Tuesday each month, 7:30 p.m., Los Posas Country Club, Camarillo.
Henry J. Rulfo.....President
302 Glen Ellen Dr., Ventura 93003
F. K. Helbling.....Secretary
3081 Loma Vista Rd., Ventura 93003

YOLO County Medical Society. Meets First Wednesday.
Spencer T. Chester.....President
Woodland Clinic, Woodland 95675
Samuel C. Houston.....Secretary
3 Court St., Woodland 95695

YUBA-SUTTER-COLUSA County Medical Society, 370 Del Norte Ave., Yuba City 95991. Meets Second Tuesday.
Robert H. Greeley.....President
725 4th St., Marysville 95901
Norman K. Noordhoff.....Secretary
320 G St., Marysville 95901

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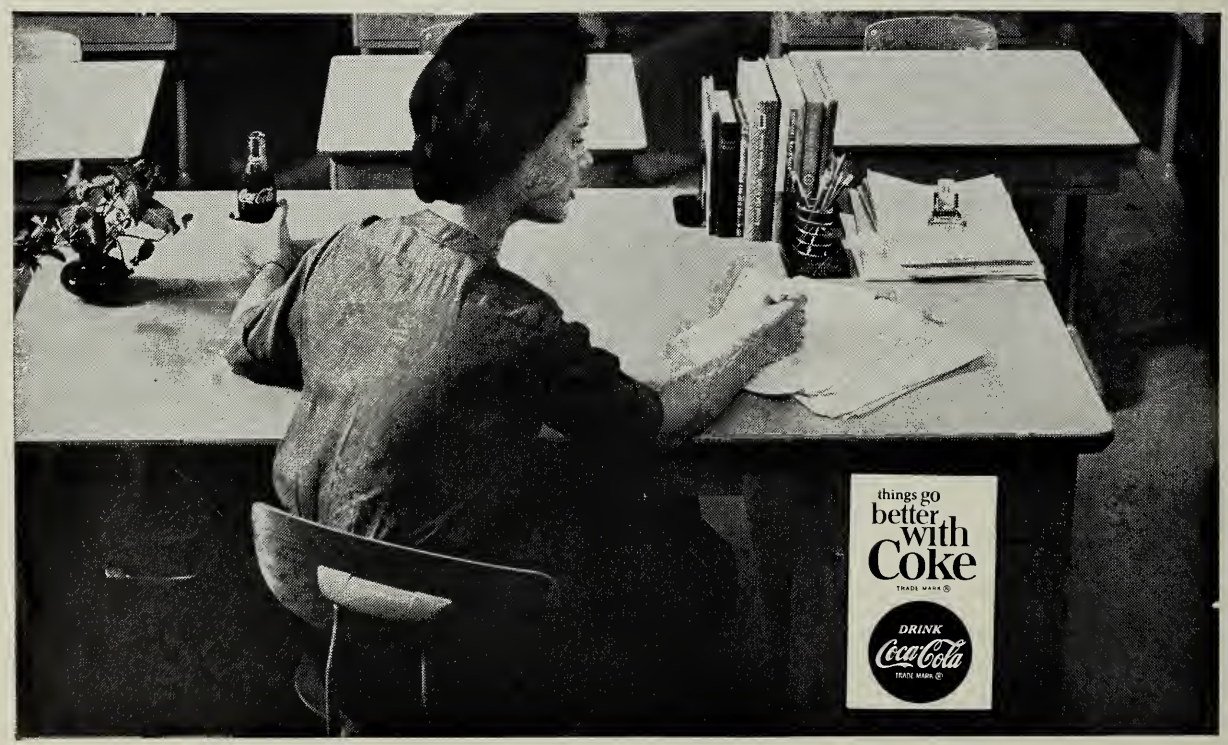
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CD-1993

Jean Kendrick Weston, M.D., to Head AMA Drug Department

Jean Kendrick Weston, M.D., Ph.D., a scientist distinguished in the fields of clinical investigation, medical administration and experimental pathology, has been named director of the American Medical Association Department of Drugs.

Dr. Weston took his post June 5, moving from a position as director of medical affairs for Burroughs Wellcome & Co., (U.S.A.) Inc., Tuckahoe, N.Y.

The Department of Drugs, an arm of the Division of Scientific Activities, is one of the largest and most diversified of the AMA departments. With 18 scientists, 14 research assistants, and a present budget of $600,000 it carries out functions which include: (1) providing current, authoritative information to the medical profession on drugs and drug therapy, including descriptions of drugs, evaluations, indications and contraindications for use, reports of adverse reactions, nomenclature, and sources; (2) advising on cosmetics; and, (3) providing a central registry of information on adverse reactions to drugs and on hazards of household chemicals and pesticides.

The Department is organized into six sections: Drug Evaluation, Adverse Reactions, Cosmetics, Nomenclature, Documentation, and Editorial.

In addition, the Department is responsible for staffing the AMA Committee on Cutaneous Health and Cosmetics, and the Council on Drugs, which includes the Registry for Adverse Reactions to Drugs and Other Chemicals. Dr. Weston, as director of the Department of Drugs, will serve as secretary of the Council on Drugs.

Dr. Weston, 57, was born in Spokane, Wash. He took his A.B. degree at Northern State Teachers' College, Marquette, Mich., in 1930, his M.A. at the University of Michigan in 1931, his Ph.D. in neuroanatomy at the University of Michigan in 1933, and his M.D. at Temple University, Philadelphia, Pa., in 1941.

An early interest in experimental pathology later turned to an interest in clinical investigation, particularly as related to drugs, and medical administration. Between 1938 and 1951 he rose from instructor to Professor of Anatomy at Temple University School of Medicine. In 1951 he joined Parke, Davis & Company as laboratory director for experimental pathology and toxicology. In 1957 he became director of the firm's Department of Clinical Investigation, a position he held until joining Burroughs Wellcome & Co., in 1962.

Dr. Weston's bibliography through 1960 includes 23 separate listings.

His wife Kathleen, whom he married in 1933, also is a Doctor of Medicine with special interest in experimental pathology. They have two children, a son 10 years old, and a daughter aged seven.

★

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The usual precautions for intramuscular injection should be followed with the parenteral form. Intravenous injection should not exceed a rate of 1 cc. per minute or 100 mg. per dose. As with other injectables, soft-tissue reactions have been rarely reported, and are usually associated with faulty technique.

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BOOKS RECEIVED

Books received by CALIFORNIA MEDICINE *are acknowledged in this column. Selections will be made for more extensive review in the interest of readers as space permits.*

ADVANCES IN DIAGNOSTIC UROLOGY—edited by Joseph J. Kaufman, M.D., F.A.C.S., Associate Professor of Surgery/Urology, School of Medicine, University of California at Los Angeles. With 14 Contributing Authors. Little, Brown and Company, Boston, Mass., 1964. 294 pages, $12.50.

AIDS TO PSYCHIATRIC NURSING—Second Edition—A. Altschul, B.A. (Lond.), S.R.N., R.M.N., Principal Tutor, The Bethlem Royal Hospital and The Maudsley Hospital. With a foreword by D. L. Davies, M.A., D.M., D.P.M., Dean, Institute of Psychiatry, University of London. Bailliere, Tindall and Cox, London, 1964. The Williams & Wilkins Co., Baltimore 2, Md., exclusive U.S. agents. 332 pages, $4.50 (paperback).

ANXIETY AND TENSION CONTROL—A Physiologic Approach—Edmund Jacobson, M.D., LL.D., Ph.D. F.A.C.P., Director, Laboratory for Clinical Physiology, Chicago, and the Jacobson Clinic; formerly Research Associate, Assistant Professor of Physiology (1926-1936), University of Chicago; formerly Associate Attending Physician (Medicine), Michael Reese Hospital. J. B. Lippincott Company, East Washington Square, Philadelphia 5, Pa., 1964. 216 pages, plus 32 pages of a manual—Self-Operations Control, $9.00.

BAILEY'S TEXTBOOK OF HISTOLOGY — Fifteenth Edition—Revised by Wilfred M. Copenhaver, Ph.D., Professor of Anatomy, College of Physicians and Surgeons, Columbia University. The Williams & Wilkins Company, Baltimore 2, Md., 1964. 679 pages, $13.50.

BETTER HEALTH FOR WOMEN—Charles Richard Alsop Gilbert, M.D., Fellow of American College of Surgeons; Fellow of American College of Obstetrics and Gynecology; Fellow of American Society of Abdominal Surgeons. Doubleday & Company, Inc., New York, 1964. 365 pages, $4.95.

BUSINESS MANAGEMENT OF A MEDICAL PRACTICE—Bernard D. Hirsh, LL.B., Director, Law Department, American Medical Association, Chicago, Illinois. The C. V. Mosby Company, St. Louis, 1964. 190 pages, $7.75.

CIBA FOUNDATION STUDY GROUP NO. 17—DIET AND BODILY CONSTITUTION—in honor of Professor J. F. Brock. Edited by G. E. W. Wolstenholme, O.B.E., M.A., M.B., M.R.C.P., and Maeve O'Connor, B.A. Little, Brown and Company, Boston, 1964. 120 pages, with 31 illustrations, $2.95.

CLINICAL NURSING: A HELPING ART—Ernestine Wiedenbach, R.N. M.A., C.N.M., Associate Professor, Obstetric Nursing, Yale University School of Nursing. Springer Publishing Company, Inc., New York, 1964. 118 pages, $2.75 (paperbound).

CLINICAL USE OF DEXTRAN SOLUTIONS, THE—Amiel Segal, B.A., Department of Hematology, Walter Reed Army Medical Center, Walter Reed Army Institute of Research, Washington, D. C. Foreword by Col. William H. Crosby, M.C. Grune & Stratton, New York and London, 1964. 74 pages, $4.50.

CORONARY PATIENT, THE—Hospital Care and Rehabilitation—Gladys Nite, M.A., R.N., Principal Investigator and Director, Research in Nursing, Community Studies, Inc., Kansas City, Missouri; and Frank N. Willis, Jr., Ph.D., Co-Investigator and Research Associate, Community Studies, Inc., Kansas City, Missouri. The Macmillan Company, New York, and Collier-Macmillan Limited, London, 1964. 418 pages, $12.50.

FEAR OF BEING A WOMAN, THE—A Theory of Maternal Destructiveness—Joseph C. Rheingold, M.D., Ph.D., Research Associate in Psychiatry, Harvard Medical School. Grune & Stratton, Inc., New York and London, 1964. 756 pages, $10.00.

FUNDAMENTAL AIDS IN ROENTGEN DIAGNOSIS—Emphasizing Spot Filming and Fluoroscopy—Charles B. Storch, M.D., Associate Clinical Professor, New York University—Cineradiology, Radiology, Cleft Palate Research; Director, Radiology Department, Lefferts General Hospital, Brooklyn, N.Y.: Associate Attending Radiologist, Brookdale Medical Center, Brooklyn, N.Y. Grune & Stratton, Inc., New York and London, 1964. 370 pages, $14.75.

GOUT—Second Edition—John H. Talbott, A.B., M.D., D.Sc. (Hon.), Director, Division of Scientific Publications, American Medical Association; Editor, Journal of the American Medical Association. Grune & Stratton, Inc., New York and London, 1964. 261 pages, $8.50.

GROWTH DISORDERS IN CHILDREN AND ADOLESCENTS—Solomon A. Kaplan, M.D., Associate Professor of Pediatrics, University of Southern California; Head, Division of Endocrinology, Childrens Hospital of Los Angeles; Director of Laboratories, Childrens Hospital of Los Angeles; and Attending Physician, Los Angeles County Hospital, Los Angeles, California. Charles C. Thomas, Publisher, 301-327 East Lawrence Avenue, Springfield, Illinois, 1964. 202 pages, $8.50.

HIPPOCRATES—THE THEORY AND PRACTICE OF MEDICINE—introduction by Emerson Crosby Kelly, M.D., Practicing Surgeon, Albany, New York. Philosophical Library, New York, 1964. 374 pages, $7.50.

HYPOANALYSIS—Second Edition—Lewis R. Wolberg, M.D., Dean and Medical Director, Postgraduate Center for Mental Health; Clinical Professor of Psychiatry, New York Medical College, Flower Fifth Avenue Hospital, New York City; foreword and special contribution by A. Kardiner, M.D., formerly Director of Psychoanalytic Clinic at Columbia University, and Clinical Professor of Psychiatry, Columbia University. Grune & Stratton, New York and London, 1964. 424 pages, $7.50.

MODERN TREATMENT—Volume 1, Number 2, March 1964—Treatment of Pulmonary Diseases by Carl Muschenheim, M.D., Guest Editor; Treatment of Liver Disease by Richard B. Capps, M.D., Guest Editor. Harper & Row, Publishers (Hoeber Medical Division), New York, 1964. Bimonthly publication, by subscription only; 6 books a year; $16.00 per year (laminated paperback); 526 pages.

NURSE'S GUIDE TO ANAESTHETICS, RESUSCITATION AND INTENSIVE CARE, A—W. Morris, M.D., F.F.A.R.C.S., and D. Campbell, M.B., Ch.B., D.A., F.F.A.R.C.S., Consultant Anaesthetists, Glasgow Royal Infirmary. Foreword by Margaret C. N. Lamb, R.G.N., Diploma in Nursing (London); Diploma in Education (Chicago), Vice-Chairman of the General Nursing Council for Scotland; Education Officer the Royal College of Nursing and National Council of Nurses of the United Kingdom, Scottish Board. E. & S. Livingstone Ltd., Edinburgh and London, 1964. Distributed in the United States by The Williams & Wilkins Company, Baltimore 2, Md. 116 pages. $5.25.

OCULAR AND ADNEXAL TUMORS—New and Controversial Aspects—Symposium sponsored by Department of Ophthalmology, Baylor University College of Medicine. Milton Boniuk, M.D., Editor, Assistant Professor of Ophthalmology and Chief, Sections of Ophthalmic Pathology and Ocular Oncology, Baylor University College of Medicine, Houston, Texas. The C. V. Mosby Company, St. Louis, Mo., 1964. 511 pages, with 363 figures and 4 color plates, $25.00.

PEDIATRIC PATIENT 1964, THE—Coordinating Editor: Sarah R. Gustafson, Ph.D., Director, Department of Medical Literature, Hoffmann-La Roche Inc., Nutley, New Jersey; and Consulting Editor: David Baird Coursin, M.D., F.A.A.P., Director of Research, Research Institute, St. Joseph's Hospital, Lancaster, Pennsylvania. J. B. Lippincott Company, Philadelphia, Pa., 1964. 160 patients, $4.50.

PHYSICAL EXAMINATION OF THE SURGICAL PATIENT—Third Edition—J. Englebert Dunphy, M.D., F.A.C.S., Professor of Surgery, University of California School of Medicine, San Francisco; and Thomas W. Botsford, M.D., F.A.C.S., Assistant Clinical Professor of Surgery, Harvard Medical School; Senior Associate in Surgery, Peter Bent Brigham Hospital; Associate in Surgery, Children's Medical Center. W. B. Saunders Company, Philadelphia and London, 1964. 396 pages, $8.50.

PROBLEMS OF DYNAMIC NEUROLOGY—An International Volume—Studies on the Higher Functions of the Human Nervous System; edited by Lipman Halpern, Jerusalem. Published by The Department of Nervous Diseases of the Rothschild Hadassah University Hospital and the Hebrew University Hadassah Medical School, Jerusalem, Israel, 1963. Distributed in the United States by Grune & Stratton, New York. Publication Date: 1964. 509 pages, $15.00.

PROSPECT OF IMMORTALITY—Robert C. W. Ettinger, Doubleday & Company, Inc., New York, 1964. 190 pages, $3.95.

(Continued on Page 26)

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*First synthesized by Syntex Laboratories (Djerassi et al.: Paper presented before the Division of Medicinal Chemistry, American Chemical Society Meeting, Milwaukee, Wisconsin, April 3, 1952).

BOOKS RECEIVED

(Continued from Page 18)

REHABILITATION—A Manual for the Care of the Disabled and Elderly—Gerald G. Hirschberg, M.D., F.A.C.P., Assistant Clinical Professor of Physical Medicine, University of California School of Medicine, San Francisco, California; Chief, Physical Medicine and Rehabilitation Service, Contra Costa County Hospital; Leon Lewis, M.D., F.A.C.P., Medical Director, Rehabilitation Medical Group, Berkeley, California; and Dorothy Thomas, R.N. B.S., Director of Nurses, Fairmount Hospital of Alameda County, California. J. B. Lippincott Company, Philadelphia and Montreal, 1964. 377 pages, $7.50.

SHORT HISTORY OF THE GOUT AND THE RHEUMATIC DISEASES, A—W. S. C. Copeman, M.D., F.R.C.P. University of California Press, Berkeley and Los Angeles, 1964. 236 pages, $6.00.

SPECIALTIES IN GENERAL PRACTICE—Third Edition—edited by Russell L. Cecil, M.D., Professor of Clinical Medicine, Emeritus, Cornell University Medical College, New York City, and Howard F. Conn, M.D., Staff Uniontown Hospital, Uniontown, Pennsylvania. W. B. Saunders Company, Philadelphia and London, 1964. 676 pages, $17.50.

STERILITY—The Diagnostic Survey of the Infertile Couple—Third Edition—Walter W. Williams, M.D., F.A.C.O.G., Clinical Geneticist. Published by Walter W. Williams, M.D., Springfield, Mass., 1964. 515 pages, $28.50.

SURGERY OF CHILDHOOD FOR NURSES—Second Edition—Raymond Farrow, M.A. B.M. B.Ch. (Oxon), F.R.C.S. (Eng.), Orthopaedic Surgeon, The North Middlesex Hospital, London; Tutor in Surgery, St. Bartholomew's Hospital, London; and Duncan Forrest, M.B., Ch.B. (N.Z.), F.R.C.S. (Eng.), Pediatric Surgeon, The Westminster Children's Hospital, London, The Children's Hospital, Sydenham, and Queen Mary's Hospital for Children, Carlshalton. E. & S. Livingstone Ltd., Edinburgh and London, 1964. Distributed in the United States by The Williams & Wilkins Company, Baltimore 2, Md. 292 pages, $7.00.

TEXTBOOK OF UROLOGY—Second Edition—Victor F. Marshall, M.D., F.A.C.S., Clinical Professor of Surgery (Urology), Cornell University Medical College; Attending Surgeon-in-Charge, Urology, James Buchanan Brady Foundation of The New York Hospital; and Associate Attending Urologist, The Memorial Sloan-Kettering Center for Cancer, New York City. Hoeber Medical Division, Harper & Row, Publishers, Inc., New York, Evanston, and London, 1964. 355 pages, $8.50.

ZYMOGRAM IN CLINICAL MEDICINE, THE—S. H. Lawrence, M.D., Assistant Clinical Professor, Department of Medical Microbiology and Immunology, University of California Medical School, Los Angeles, Calif. Charles C. Thomas, Publisher, Springfield, Illinois, 1964. 100 pages, $5.75.

Epileptics Suffer Unfair Job Discrimination

Most epileptics can, and should, work. But epileptics are excluded from employment by most companies more than any other major disability group.

These are some of the little known facts on epilepsy reported in an article in the July *Today's Health* magazine, published by the American Medical Association.

Latest estimates are that about 1.8 million Americans have epilepsy, making the disease as common as diabetes, it was pointed out.

When their seizures are controlled, epileptics are perfectly capable, the article stressed. The employment problem is caused primarily by the few epileptics whose seizures are frequent and severe, who have additional physical or mental disabilities, or who are unprepared for competitive industry because they have been overprotected all their lives, it said.

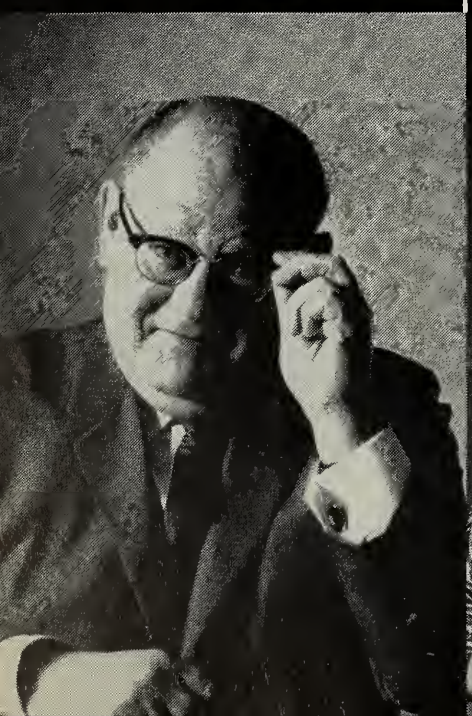
Although a frequently voiced objection is that epileptics are accident-prone, records prove that properly placed epileptics are exceptionally safe workers,

in the overweight stable adult

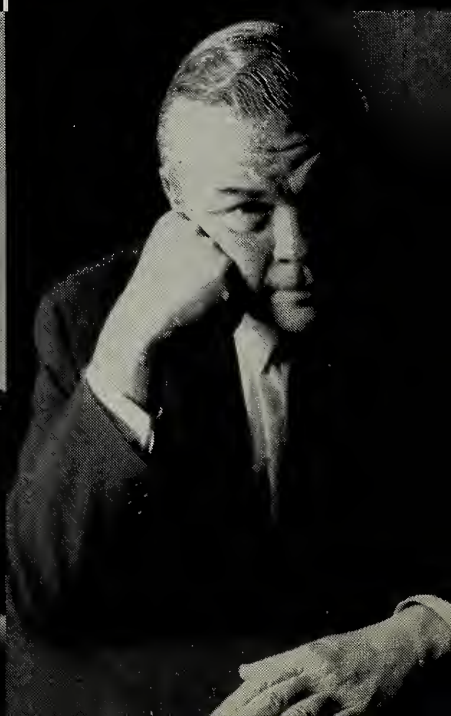
...fasting serum levels of insulin are usually normal, postprandial levels excessive[1-3]

...insulin acts in adipose tissue via hexose monophosphate shunt, principal path of glucose conversion to storage fat[1,4]

...excessive endogenous insulin acts to stimulate lipogenesis and weight gain[1,3,4]







according to the article. Another misconception is that workmen's compensation insurance companies object to epileptics on the payroll. This is not true. The hiring of disabled persons does not increase the employer's insurance rates.

The situation is improving at the present time, however, the article continued. The U.S. Civil Service Commission has adopted an official policy that epilepsy will not bar a person from federal employment, and companies which will knowingly hire epileptics are increasing.

Dr. George Wright, rehabilitation expert at the University of Wisconsin, has urged that facilities be set up to give medical, psychological, and vocational help to the vast majority of epileptics who can be helped, but who are not being helped. Arrangements also should be made for the care of those who cannot be employed, such as sheltered workshops, and epilepsy must be made respectable through public understanding so that epileptics do not go into hiding, according to Dr. Wright.

Maryland has a program of this type, the article stated, and 12 other states are adopting similar plans.

Several plants for epileptic rehabilitation also were described in the magazine.

The west coast branch of Epi-Hab was formed in 1956 by Frank Risch, Ph.D., then a psychologist at the Los Angeles Veterans Administration Hospital. The plant was based on the knowledge that epileptics who are working suffer far fewer seizures than those who are idle, and that about half of all victims receive a mental warning from a day to 10 seconds before a seizure. Dr. Risch opened a second plant in Los Angeles later and others were organized in Jamaica, N.Y., and Phoenix, Ariz., in 1958.

So far, these plants have employed for varying periods about 1,200 epileptics and have permanently placed about 300 in private industry. In their first five years, the Los Angeles Epi-Habs had only 30 mishaps attributable to seizures and none imperiled life, limb, or machinery.

Author of the article is Shirley Motter Linde.

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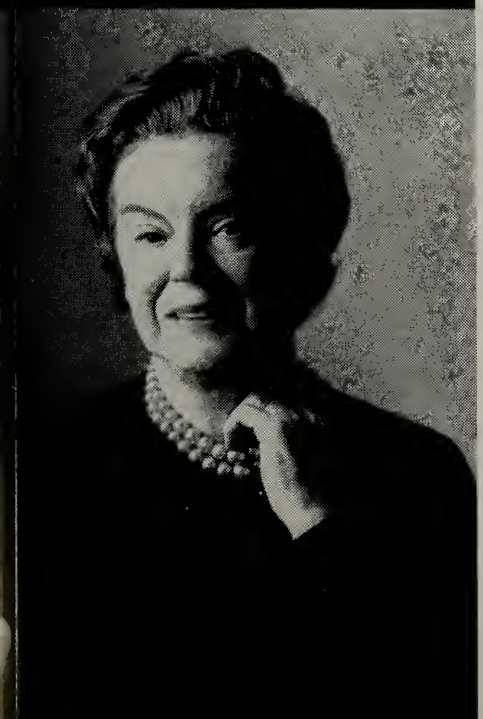
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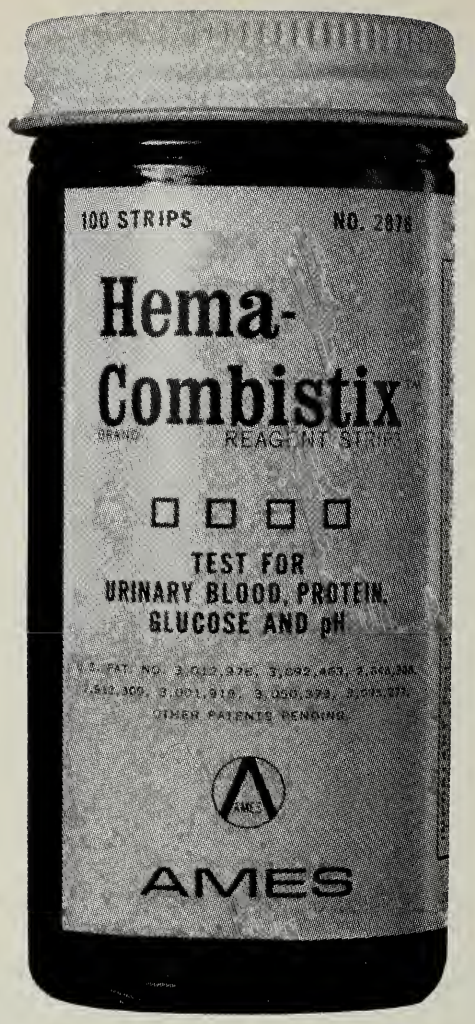
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1. Gordon, E.S.: Metabolism 11:819, 1962. 2. Grodsky, G.M. et al.: Metabolism 12:278, 1963. 3. Weller, C. et al.: Scientific Exhibit, A.M.A., June 1962. 4. Sadow, H.S.: Metabolism 12:333, 1963. 5. Faludi, G.: J. Am. Med. Women's Assoc. 18:722, 1963. 6. Faludi, G.: Geriatrics 18:452, 1963. 7. Williams, R.H.: Textbook of Endocrinology, Ed. 3, Saunders, Phila., 1962, p. 610. 8. Weller, C. and Linder, M.: Am. Therap. Soc., June 1963. 9. Moss, J.M. et al.: Med. Times, July 1964.

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Find Newborns See Better Than Previously Supposed

A newborn baby has greater visual acuity and coordination of eye movements than previously supposed, Los Angeles researchers said recently.

Two studies of infants averaging one to two days old were reported by Glenn O. Dayton Jr., M.D., Margaret H. Jones, M.D., Barry Steele, Marvin Rose, Patrick Aiu and Richard A. Rawson, M.D., in the *Archives of Ophthalmology*, published by the American Medical Association.

Estimates of visual acuity at birth have ranged from 20/2,000 to 20/670 and the development of normal 20/20 vision has been believed to evolve during the first five years of life, the authors pointed out.

However, in a study of 39 full-term, apparently normal infants, 9 demonstrated 20/150 vision, according to the report.

The technique used was one which had been established for determining visual acuity in adults. It was performed by means of a canopy placed over the baby's bed. Eye movements were recorded electrically.

The records of only 13 of the infants could be interpreted because the others did not respond, some because they fell asleep.

The researchers concluded that the visual acuity in newborns is "at least 20/150 and may be even better." Not only the motor but also the sensory capacity for coordinated eye movement may already be present in the newborn, they said. Only infrequently were dissociated eye movements observed, they added.

Having determined that some newborns have sufficient visual acuity to fix both eyes on a single target, the researchers tested a group of 45 full-term, normal infants on their ability to follow a series of dots moving across the canopy.

Seventeen of the infants, the majority of those whose eyes were open during the test, were capable of locating the moving dots and following them across the canopy, they reported.

Each eye moved simultaneously in the direction of the target, they said, and both eyes moved over the same period of time. Tracings of the individual eye movements were similar indicating close conjugation of the eyes.

The study documents a fixation reflex which is innately better developed than heretofore reported, with the ocular movement purposeful and well coordinated rather than aimless and unconjugated, although not as smooth as in the adult, the authors commented.

The study was made at the University of California, Los Angeles, The Center for the Health Sciences.

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■ *Numerous reports of chronic renal disease in patients who habitually use phenacetin-containing compounds to excess have aroused considerable controversy over the possible relationship between phenacetin, alone or in combination with other analgesics, and the occurrence of renal damage.*

Between 1961 and 1964, we have seen 23 patients with severe renal failure and a history of prolonged, excessive use of phenacetin-containing compounds. In all instances the clinical and laboratory data were compatible with "phenacetin nephritis" as described in Europe and Australia and recently in the United States and Canada. This report evaluates the findings in the 23 cases and cautions against the use of phenacetin, particularly in patients with impaired renal function.

Renal disease attributed to ingestion of phenacetin has been extensively reported in Europe and Australia.* Reports of similar cases in this country[25-27,29,30] and Canada[19] have been infrequent, leading to the impression that nephropathy resulting from overuse of phenacetin (acetophenetidin) is uncommon in this hemisphere.[31] Recent experience by us and others,[5-7,25,32] however, is rapidly contradicting this impression. During the past three years, we have seen severe renal insufficiency in association with a history of prolonged, excessive use of phenacetin-containing compounds in 23 patients referred to the Renal Service of the University of California Medical Center for evaluation.† The data on the patients were carefully reviewed to exclude other possible causes of deterioration of renal function. Two of the 23 cases were considered doubtful because excessive ingestion of phenacetin could not be established unequivocally. The patients were included in our series, however, because the clinical and laboratory findings (and, in one, postmortem evidence of bilateral papillary necrosis) were typical of "phenacetin nephritis."

The pertinent findings in the 23 cases, although not conclusive, provide strong circumstantial evi-

*References Nos. 1-4, 14, 16, 21, 23, 24, 28, 33, 34.

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†Our series does not include eight cases of papillary necrosis thought to be caused by excessive ingestion of phenacetin which are being reported by Dr. Donald R. Smith of the Division of Urology, University of California Medical Center.[32]

dence to support belief that phenacetin or its metabolites were instrumental in the pathogenesis of the renal lesions in these patients.

Data on Cases

The clinical and laboratory findings in the 23 cases are summarized in Table 1. The patients, eighteen women and five men, ranged in age from 40 to 70 years. All had taken phenacetin-containing compounds to excess for at least two years; in half the group the duration of analgesic abuse was ten years or more. The total dosage of phenacetin was difficult to determine, since in general the patients were evasive when questioned about their drug intake. Most, however, admitted to taking analgesics daily and in large amounts. Anacin,‡ a combination of phenacetin (160 mg per tablet), aspirin and caffeine, was the most popular preparation, although other phenacetin-containing mixtures were also used. In all cases the drugs were taken for relief of pain, chiefly headache; in one case, that of a patient with rheumatoid arthritis, a phenacetin-containing preparation had been prescribed.

In the majority of patients the presenting symptom was nonspecific, such as indigestion or abdominal pain, pain in the flank or back or edema of the face and legs. Many of the patients also complained of episodes of nausea and vomiting over long periods (six months to two years). Hypertension was present in ten cases, but was mild in degree except in two patients (Cases 6 and 12) who also had diabetes mellitus. All but one patient had severe anemia (hematocrit, 21 to 33 per cent). Neurological signs (hyperactive reflexes, positive plantar extensor response, decreased vibration sense, decreased position sensation, convulsion, somnolence, disorientation, or agitation and confusion) were noted in seven cases. Two patients (Cases 11 and 20) were admitted to the hospital in a semicomatose state. Seven were considered psychoneurotic. Gastric or duodenal ulcers were found in four patients (Cases 2, 7, 9 and 17); Kincaid-Smith[18] has similarly reported a high incidence of ulcer in phenacetin users.

Kidney function was severely impaired in all but two patients (Cases 10 and 21), as evidenced by nonprotein nitrogen levels ranging from 46 to 225 mg per 100 ml, serum creatinine concentrations ranging from 4.0 to 15.2 mg per 100 ml and creatinine clearances ranging from 50 ml per minute to as low as 2 ml per minute. Except for inability to excrete concentrated urine, the urinary abnormalities were minimal, consisting in most cases of slight proteinuria (0 to 1+), occasional red and white blood cells, and rare casts (usually hyaline). Urine cultures, performed on two to nine occasions in 22 cases, were persistently negative in 11; and in the other 11 cases urinary infections appeared late in the course of disease.

Serum methemoglobin and sulfhemoglobin levels, determined in six cases, were positive in two. One other patient (Case 13), who also claimed to have taken no analgesics for a long time, had the slatey blue skin often associated with prolonged use of phenacetin.[4,5]

X-ray examination, either by plain film, intravenous urogram, retrograde pyelogram or tomogram, was performed in all cases, although in one (Case 11) the kidneys could not be visualized because of massive ascites. In five patients, the kidneys were normal in size, in eleven both kidneys were smaller than normal, and in four one kidney was decreased in size. Roentgenological evidence of papillary necrosis was found bilaterally in eight cases and unilaterally in four. In one of the patients in whose one functioning kidney papillary necrosis was found (Case 14), obstruction of the ureter by a sloughed papilla was thought to be the cause of acute renal insufficiency. After the patient discontinued taking Bromo-Seltzer®, renal function returned to normal (creatinine clearance of 109 ml per minute). Roentgenographic examination during a follow-up period of approximately two years has shown no further evidence of papillary necrosis and the *Pseudomonas aeruginosa* infection has cleared. One additional patient (Case 23) had undergone nephrectomy previously; the remaining kidney, which was hypertrophied, showed evidence of papillary necrosis.

Renal biopsy, performed in four cases, showed interstitial fibrosis in three. In the remaining cases renal biopsy was contraindicated by the presence of a bleeding tendency, hypertension, severely impaired renal function or small kidneys. Three of the 23 patients were examined at autopsy. The results confirmed the biopsy finding of interstitial nephritis in one (Case 7) and showed the presence of renal papillary necrosis bilaterally in addition to interstitial nephritis in the others (Cases 20 and 22). The pathological findings will be described in detail in a subsequent report.

The findings in two patients (Cases 11 and 12) were of particular interest. The patients, a married couple (no consanguinity), were admitted to the hospital within a month of each other. Both had severe azotemia, associated with convulsions and disorientation. The wife was in a semicomatose state at the time of admission. On careful questioning, both admitted to taking A.P.C. (aspirin-phenacetin-caffeine) tablets in large quantities for years. They kept the tablets in a bowl in the living room and took them like candy. Neither was aware of having renal disease, although both had experienced several episodes of urinary frequency and nocturia during

‡Whitehall Laboratories, manufacturers of Anacin, informed us that phenacetin was removed from the compound in January 1963.

the six months before admission to the hospital. The husband was hypertensive and had diabetes mellitus, which was controlled by diet and 20 units of NPH insulin daily; he died of renal failure shortly after being discharged. At present, the wife has a creatinine clearance of 9 ml per minute, requiring stringent dietary, fluid and salt regulation.[13]

Discussion

The clinical and laboratory findings in the present series were similar to those described in previous reports of renal disease in association with excessive use of analgesics. As in the cases here described, the presenting complaint is usually nonspecific. Chronic headache is the outstanding symptom, and often is the clue to a history of prolonged, excessive use of analgesics. Many compounds for headache and other types of pain contain phenacetin, and this drug has been consistently implicated in such cases. The typical picture consists of severe anemia, absence of hypertension (or only mild hypertension), and serious impairment of renal function, with re-

TABLE 1.—*Clinical and Laboratory Data in 20 Cases of Suspected Phenacetin Nephritis*

Case No.	Age and Sex	Phenacetin Intake: Estimated Cumulative Dose (kg)	Phenacetin Intake: Duration (years)	Phenacetin Intake: Reason for Taking	Blood Pressure (mm mercury)	Hematocrit (per cent)	Ccr (ml/min*)	Urine: Protein	Urine: Culture	Roentgenographic Findings: Kidney Size r	Kidney Size l	Papillary Necrosis r	Papillary Necrosis l
1	41 F	5.8-8.3	5	Headache	150/100	27	15	0-1+	Negative	<	<	0	0
2	48 F	7.0	10	Headache	115/65	26	25	0	Negative	<	<	+	+
3	51 F	1.5	2	Headache	120/80	27	7	0-2+	*Aerobacter*	<	<	0	0
4	40 F	3.7	8	Headache, backache	150/110	21	11	1+	*Enterococci, Aerobacter*	N	N	0	0
5	61 F	3.6	10	Headache, rectal pain	110/70	23	12	1+	Negative	N	<	+	+
6	51 F	10.0	7	Headache	215/120	33	17	1+	Negative	<	<	0	0
7	70 F	2.2	10	Ophthalmic neuralgia	160/110	31	7	0-1+	*E. coli, Enterococci*	N	N	0	0
8	63 F	8.3	10	Headache	150/80	28	6	1+	Negative	<	<	+	0
9	50 F	2.5	5	Rheumatoid arthritis	150/100	28	4	0-1+		N	N	0	0
10	42 F	?	Many	Headache, backache	140/90	42	50	0-1+	Negative	<	<	+	+
11†	62 F	?	6	Headache	160/100	23	2	1+	*E. coli*	?	?	?	?
12	62 M	8.0-10.0	25	Headache, abdominal pain	210/90	25	5	1+	*Staph. albus*	<	<	+	+
13	47 M	By the bottle	25	Headache	110/60	30	6	0-1+	Negative	<	<	0	0
14	45 M	2.5	20	Epigastric pain	120/80	25	3	0-1+	*Ps. aeruginosa*	>	<	+	0
15	67 F	6.2	17	Headache	160/80	35	29	1+	Negative	N	N	0	0
16	28 M	?	6	Headache	150/100	28	10	1-2+	Negative	>	>	+	+
17	53 F	4.7	8	Headache	145/95	38	34	0-1+	*E. coli*	<	N	?	0
18	46 F	?	3	Headache	160/80	35	5	1+	Negative	<	<	0	0
19	38 F	11.0	19	Leg pain (ulcers)	140/90	33	29	1+	*E. coli*	<	<	+	+
20	71 F	2.3	2	Headache	110/50	29	5	2+	*Aerobacter, E. coli*	N	N	+	+
21	50 F	17.5	15	Gouty arthritis	120/80	40	48	1+	Negative	<	N	0	+
Doubtful Cases													
22	65 F	?	5	Rheumatoid arthritis	155/80	21	8	4+	*Enterococci, E. coli*	<	<	+	+
23‡	48 M	0.5	2	Abdominal pain	130/80	29	14	1+	*Proteus*	−	>	−	+

*Corrected to a body surface area of 1.73 square meters.
†Patient had massive ascites.
‡Right kidney had been removed previously.

Explanation of Abbreviations and Symbols
Ccr=Creatinine clearance.
r=Right kidney; *l*=left kidney.
<=Smaller than normal.
>=Larger than normal.
N=Normal.

markably slight urinary abnormalities.[27,28] The kidneys are usually either of normal size or shrunken. The renal lesion consists of interstitial nephritis, often in combination with papillary necrosis.[11,12,15,19]

After oral ingestion the drug is absorbed completely from the upper part of the gastrointestinal tract. A maximum plasma level is reached within one or two hours. A fraction of the ingested drug is bound to plasma protein; the remainder (approximately 99.8 per cent) is metabolized and converted to acetyl-p-aminophenol, some of which is conjugated with glucuronic acid or sulfate ion. Less than 0.1 per cent is changed to p-phenetidin by deacetylation. In 24 hours, 3.5 per cent of the ingested dose is found in the urine in the form of free aminophenol and 74 per cent in the form of conjugated N-acetyl-p-aminophenol.*[10]

Toxic properties other than nephrotoxicity have been well established. One of the major toxic effects of phenacetin is the conversion of hemoglobin to methemoglobin and sulfhemoglobin within the red blood cells,[8] with consequent reduction in erythrocyte survival time. The ingestion of phenacetin can also cause intravascular hemolysis,[8,17] leading to severe anemia. Persons with an inherited deficiency of glucose-6-phosphate dehydrogenase are said to be particularly susceptible to this type of hemolytic anemia.[9] The formation of methemoglobin and sulfhemoglobin and the decreased erythrocyte survival time may cause a reduction in the amount of hemoglobin available for oxygen transportation, leading to chronic anoxemia. The relative hypoxia in combination with the direct depressant action of high concentrations of phenacetin on the heart, circulation and central nervous system[7,10] may lead to vascular collapse and shock. The symptoms of central nervous system disturbance include severe headache, irritability, nervousness, insomnia, inability to concentrate and delirium, which may be followed by depression, stupor and even coma. Paradoxically, phenacetin has the ability to relieve the headaches it causes. The headaches, however, usually become more severe when phenacetin is withdrawn, causing the patient to seek relief in increased doses of the drug.

Methemoglobin and sulfhemoglobin disappear from the blood in several days and in two to three months, respectively, after withdrawal of phenacetin,[4] which might account for negative findings in four of the six cases in the present series in which the plasma methemoglobin and sulfhemoglobin levels were determined. These substances are responsible for the reversible slatey cyanosis of skin, mucosa and fingernails seen in association with excessive ingestion of phenacetin and as noted in one of the patients (Case 13) in the series.

The cause and mechanism of the nephropathic change is not known. Circumstantial evidence, however, suggests a cause-and-effect relationship between phenacetin addiction and renal damage. Several mechanisms have been suggested including the toxic effects of the breakdown products of phenacetin, chronic renal hypoxia resulting from decreased erythrocyte survival time, excretion of abnormal forms of hemoglobin, and a hypersensitivity reaction.[28] Chemical toxicity has also been suggested. For example, acetic-4-chloranilide, a contaminant produced in the manufacture of phenacetin, may make the kidney susceptible to bacterial invasion, with subsequent inflammatory changes.[16] Gilman[9] postulated that the combination of phenacetin and aspirin or caffeine might act synergistically to produce renal damage, or that aspirin alone might be the toxic agent. Aspirin, in large doses, has been used for many years at the U.C. Medical Center, San Francisco, for the prolonged treatment of rheumatoid diseases. Whereas it can cause renal irritation and hematuria, we know of no instance in which it has led to serious permanent renal injury.

Despite severe renal failure the urinary abnormalities in many of the patients in the present series were slight. They were typical of those found in interstitial nephritis,[19,28] in contrast to active renal papillitis, which is characterized by hematuria (often gross) and varying degrees of pyuria, probably depending at least in part on complicating infection. We were impressed that the interstitial nephritis following phenacetin abuse may lead to dichotomy of renal function with relatively greater depression of tubular than glomerular function.

The finding of urinary tract infection in nine of the patients late in the course of disease requires consideration. Some investigators[20,27] have suggested that bacterial infection is a late complication that further compromises renal function and may be related to the sloughing of papilla, perhaps by diminishing the precarious supply of blood to this area. In eleven of the patients, however, no evidence of past or present infection of the urinary tract could be found either by history or by repeated urine cultures and quantitative bacteriologic counts. In these patients, at least, the "wastebasket" diagnosis of chronic pyelonephritis is not warranted. In addition, some of the patients in whom urinary tract infections developed recovered promptly following sterilization of the urine by administration of antibiotics, whereas such treatment is usually ineffective in patients with chronic pyelonephritis. Pyelonephritis associated with papillary necrosis has been reported as a complication in nephrocalcinosis, sickle cell anemia and diabetes mellitus.[22] One wonders whether

*N-acetyl-p-aminophenol is now being substituted for phenacetin in some drug compounds. Whether it is nephrotoxic has not yet been established.

the possibility that such patients may have increased susceptibility to nephrotoxicity from phenacetin was considered in the reported cases.

A diagnosis of chronic glomerulonephritis with renal insufficiency in the patients in the present series also appeared to be ruled out by the absence of the pronounced urinary abnormalities and hypertension so characteristic of that condition. In five cases the presence of glomerulonephritis was definitely excluded by either biopsy or autopsy findings.

All the patients were cautioned about the use of phenacetin-containing drugs. In some cases, analgesics had been discontinued some time previously on the advice of the referring physicians. In our experience, after withdrawal of phenacetin-containing compounds the renal lesion tended to stabilize and further papillitis and renal damage did not occur. Since papillary necrosis can develop before parenchymal damage is severe, discontinuation of the drug may be followed by recovery (Case 14).

Although conclusive proof is lacking, circumstantial evidence strongly suggests that phenacetin was an important factor in the occurrence of the renal lesions in the patients in this series. Unfortunately animal studies on phenacetin toxicity have not yielded conclusive evidence applicable to the problem of nephrotoxicity in man. Until the mechanism leading to renal damage of this type can be firmly established, the use of phenacetin-containing drugs should be avoided, especially in patients with known renal impairment.

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REFERENCES

1. Clausen, E., and Harvald, B.: Nephrotoxicity of different analgesics, Acta Med. Scand., 170:469, 1961.

2. Clausen, E., and Pedersen, J.: Necrosis of the renal papillae in rheumatoid arthritis, Acta Med. Scand., 170:631, 1961.

3. Croughs, R. J. M., Le Pool, A., and Ten Bokkel Huinink, S. A.: Interstitiële nephritis, waarschijnlijk door het gebruik van fenacetine, Ned. T. Geneesk., 106:1899, 1962.

4. Dwyer, B., and Gunner, B.: Phenacetin cyanosis, barbiturate habituation and cardiac arrest, Med. J. Aus., 1:13, 1963.

5. Fifield, M. M.: Renal disease associated with prolonged use of acetophenetidin-containing compounds, N.E.J.M., 269: 722, 1963.

6. Fordham, C. C., and Huffines, W. D.: Headache powders and renal disease, Arch. Intern. Med., 113:395, 1964.

7. Friend, D. G.: Analgesic abuse and renal toxicity (editorial), J.A.M.A., 184:495, 1963.

8. Friis, T., Fogh, J., and Nissen, N. I.: Erythrocyte survival time in persons abusing phenacetin, with or without renal insufficiency, Acta Med. Scand., 167:253, 1960.

9. Gilman, A.: Analgesic nephrotoxicity: a pharmacological analysis (editorial), Amer. J. Med., 36:167, 1964.

10. Goodman, L. S., and Gilman, A.: The Pharmacological Basis of Therapeutics, 2nd ed., Macmillan, New York, 1955.

11. Harrow, B. R., Sloane, J. A., and Liebman, N. C.: Renal papillary necrosis and analgesics: roentgen differentiation from sponge kidney and other diseases, J.A.M.A., 184:445, 1963.

12. Harvald, B.: Renal papillary necrosis: a clinical survey of sixty-six cases, Amer. J. Med., 35:481, 1963.

13. Hopper, J., Jr., Bolomey, A., and Wennesland, R.: Chronic renal insufficiency. Part I. Appraisal of the patient. Part II. Treatment, Ann. Intern. Med., 41:18, 1954.

14. Jacobs, L. A., and Morris, J. G.: Renal papillary necrosis and the abuse of phenacetin, Med. J. Aus., 2:531, 1962.

15. Joshi, D. P., Staggs, W. A., Parker, H. M., and Joffe, I.: Renal papillary necrosis after prolonged use of acetophenetidin, Gen. Pract., 26:118, August 1962.

16. Keller, H. M., Cottier, H., and Reubi, F.: Fehlen von Nierenveränderungen nach Colibazilleninjektionen bei mit Phenacetin chronisch behandelten Kaninchen, Schweiz. Med. Wschr., 91:1021, 1961.

17. Kellermeyer, R. W., Tarlov, A. R., Brewer, G. J., Carson, P. E., and Alving, A. S.: Hemolytic effect of therapeutic drugs: Clinical considerations of the primaquine-type hemolysis, J.A.M.A., 180:388, 1962.

18. Kincaid-Smith, D.: The association between chronic renal disease, peptic ulceration and analgesic abuse; a clinico-pathological study (abstract), in International Congress Series No. 67, J. Vostál and G. Richet, Editors, Excerpta Medica Foundation, Amsterdam, 1963, p. 91.

19. Lakey, W. H.: Interstitial nephritis due to chronic phenacetin poisoning, Canad. Med. Ass. J., 85:477, 1961.

20. Larsen, K., and Moller, C. E.: A renal lesion caused by abuse of phenacetin, Acta Med. Scand., 164:53, 1959.

21. Lindholm, T.: On renal papillary necrosis with special reference to the diagnostic importance of papillary fragments in the urine, therapy (i. a. artificial kidney) and prognosis: Report of 75 cases, including 12 with papillary fragments in the urine, Acta Med. Scand., 167:319, 1960.

22. Mandel, E. E.: Renal medullary necrosis, Amer. J. Med., 13:322, 1952.

23. McCutcheon, A. D.: Renal damage and phenacetin, Med. J. Aus., 2:543, 1962.

24. Meyler, L.: Pyelonephritis bij langdurig misbruik van fenacetine, Ned. T. Geneesk., 105:2328, 1961.

25. Moolten, S. E., and Smith, I. B.: Fatal nephritis in chronic phenacetin poisoning, Amer. J. Med., 28:127, 1960.

26. Rapoport, A., White, L. W., and Ranking, G. N.: Renal damage associated with chronic phenacetin overdosage, Ann. Intern. Med., 57:970, 1962.

27. Reynolds, T. B., and Edmondson, H. A.: Chronic renal disease and heavy use of analgesics, J.A.M.A., 184:435, 1963.

28. Ross, P.: A.P.C. as a cause of renal disease, Med. J. Aus., 2:539, 1962.

29. Rubenstein, A. H., Abrahams, C., Stables, D. P., and Levin, N. W.: Acetophenetidin nephritis and papillary necrosis, Arch. Intern. Med., 113:378, 1964.

30. Rutner, A. B., and Smith, D. R.: Renal papillary necrosis, J. Urol., 85:462, 1961.

31. Schreiner, G. E.: The nephrotoxicity of analgesic abuse (editorial), Ann. Intern. Med., 57:1047, 1962.

32. Smith, D. R.: The etiology and diagnosis of renal papillary necrosis, to be published.

33. Sorenson, A. W. S.: Phenacetin consumption in relation to 24-hour endogenous creatinine clearance, Scand. J. Clin. Lab. Invest, 13:337, 1961.

34. Zollinger, H. U.: Chronische interstitielle Nephritis bei Abusus von phenacetinhaltigen Analgetica (Saridon usw.), Schweiz. Med. Wschr., 85:746, 1955.

The Treatment of Coccidioidal Meningitis

The Use of Amphotericin B in a Group of 25 Patients

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■ *In a study of 25 patients the usefulness of amphotericin B in the control of meningeal infection produced by* Coccidioides immitis *was established. Initial treatment must be intensive, consisting of intravenous and intraspinally administered amphotericin B. Serologic evaluation of coccidioidal disease provides the most important single criterion for determining the course of the meningeal infection and for estimating the response of the patient to amphotericin B therapy.*

Final control of coccidioidal meningitis rests upon the prevention of relapse after completion of initial intensive therapy. This requires continued suppressive fungistasis by regular intracisternal injections of amphotericin B at intervals of three to seven days after the patient returns home. Such suppressive cisternal therapy does not replace the initial intensive use of both intravenously and intraspinally administered amphotericin B. This "local" type of inhibition of C. immitis *is without toxic effect upon the kidney, the red blood cells or the serum potassium values which may be associated with the intravenous administration of amphotericin B. Such intraspinal therapy, by lowering the total intravenous dosage required in the initial phase of treatment, results in a proportionate decrease in the degree of nephrotoxicity produced by amphotericin B. The total intravenous dosage given ordinarily should not exceed 5 grams.*

The long-term therapeutic plan as outlined permits the development of an adequate immune mechanism that appears essential to complete recovery from coccidioidal meningitis. The importance of such immunity in the recovery process has been previously indicated and confirmed by detailed study of a patient who required immunosuppression for successful homotransplantation of a kidney.

Our interest in the use of amphotericin B in the treatment of coccidioidomycosis was stimulated by Littman's observations,[20,21] and resulted in a report made in 1959.[52] Since then we have treated 140 patients with serious types of coccidioidal infection with this antibiotic and its value as a fungistatic against *Coccidioides immitis* seems well established.† It is effective in the arrest of disseminating coccidioidomycosis or severe primary coccidioidomycosis that is threatening to disseminate. Its use has been extended to include holding the disease in check in pregnant women with recently acquired coccidioidomycosis, or in cases in which corticosteroid therapy must be given to persons who may have latent coccidioidal infection. Amphotericin B deserves wider application as a surgical "umbrella" in the removal of residual pulmonary lesions of coccidioidal type and during drainage or excisional procedures of extrapulmonary or peripheral foci of the disease.

The nephrotoxic potential of this antibiotic has been recognized[5,32,49] and the severity of this effect appears to be in direct proportion to the total intravenous dosage used.[53] The resultant changes produced in the kidney have been authoritatively described.[17,31,36] Other toxic effects related to the intravenous use of amphotericin B include depletion of the serum potassium,[17,53] and a type of anemia which may be related to impairment of the transferrin mechanism.[51] Less important side effects associated with intravenous and intraspinal therapy, previously described, can be minimized by selection of the method of administration.[52] Despite undesirable toxicity and difficulties of administration, amphotericin B must be used for want of any better therapeutic agent with specific action against not only *C. immitis*, but other pathogenic fungi‡ and including the yeast-like organisms as well.[12,15,22,24,29,39]

Meningeal infection produced by *C. immitis* occurs more commonly in white-skinned persons, in contrast to disseminating disease without meningeal involvement, which occurs more frequently in dark-skinned people, particularly Negroes and Filipinos. Smith reported[41] that of 54 persons with meningitis, including seven children, 41 were Caucasian. Coccidioidal meningitis, if untreated is ordinarily fatal within two or three months after onset.[7,11] There are only a few recorded instances of chronic coccidioidal meningitis of longer duration.[18,28,34]

That coccidioidal infection of the meninges responds favorably to combined intravenous and intraspinal administration of amphotericin B has been reported.[11,52] Our experience with injection of amphotericin B intrathecally in the treatment of coccidioidal meningitis began in 1957. Seabury and Dascomb also reported use of the antibiotic via the lumbar canal in 1958.[37]

Method of Injection

Our studies of the injection of amphotericin B into the higher subarachnoid area via the cisterna magna (Appendix A) began in 1960, and indicate that this is the procedure of choice. It offers a more direct approach to the usual site of coccidioidal infection at the base of the brain and eliminates the danger of arachnoiditis which frequently follows continued injections of amphotericin B into the lumbar sac. The effectiveness of this method as a suppressive measure in the prevention of relapse of arrested coccidioidal meningitis is also shown in the present study of 25 patients who received amphotericin B intravenously and intraspinally. At the time of this report, all treatment, including suppressive therapy, has been discontinued in 12 patients (Numbers 1-12, Table 1) for varying periods. Three other patients (13, 14, 15) who have completed the initial period of intensive treatment in the hospital remain asymptomatic but return as outpatients to receive weekly cisternal injections of amphotericin B as suppressive therapy. They are permitted by this regimen to continue normal living at home, one of them even to attend school. Two patients remain in the hospital under initial intensive intravenous and intraspinal therapy and show favorable clinical and serological response. A third patient has been returned to intensive therapy because of relapse of coccidioidal meningitis which occurred five months after discharge. He had received insufficient suppressive therapy in that time (Appendix B). It is believed that this relapse may have been due to irregularity in the administration of suppressive cisternal injections of amphotericin B after the initial intensive treatment, which emphasizes the importance of this second phase of the plan of therapy.

Plan of Treatment

In earlier studies, suppressive treatment consisted of planned short courses of intravenously administered amphotericin B which was given after intrathecal therapy had been stopped. With accumulated experience, suppression is now maintained satisfactorily after completion of initial intensive therapy, by cisternal injections of amphotericin B (Patients 4, 8, 11, 12, 13, 14 and 15, Table 1). This also lowers the total intravenous dosage of amphotericin B required for arrest of the infection and thereby lessens the degree of nephrotoxic changes. Our experience would indicate that any latent coccidioidal infection of the meninges that may linger

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†References Nos. 8, 11, 19, 26, 37, 43, 47, 53, 54.

‡References Nos. 1, 2, 3, 4, 9, 13, 14, 16, 23, 27, 30, 38, 43, 48, 50.

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TABLE 1.—*Results of Treatment of Coccidioidal Meningitis with Amphotericin B in a Group of 25 Patients*

Case	Age Sex Race	Onset	Method of Treatment and Total Dosage: Intravenous Period	Intravenous Gm	Lumbar Period	Lumbar Mg	Cisternal Period	Cisternal Mg	Response to Treatment by Cerebrospinal Fluid Changes: Serologic (CF) B.T.	Serologic (CF) A.T.	Cell Count B.T.	Cell Count A.T.	Qu. Prot. B.T.	Qu. Prot. A.T.	Qu. Gluc. B.T.	Qu. Gluc. A.T.	Follow-up Interval (In Mos.): After Intensive Therapy	After Suppressive Therapy	Present Status‡
1	5 F C	1/58	1/58— 3/58 1 course	0.757	6/58 — 8/58 41x	11.83			1+ 1:2 CSF_L 4/58	Negative CSF_L	1,154 5/58	2	94	27	26	67	70 (3/58)	65	A
2	39 M C	12/59	12/59— 2/62 7 courses	8.240	12/59— 1/61 98x	45.85	12/60— 8/61 42x	25.28	4+ 1:8 CSF_L 1/60	Negative CSF_C 8/63	262 1/60	1 8/63	128 1/60	16 8/63	50 1/60	68 8/63	46 (3/60)	24	A
3	7 M M	2/60	3/60—11/62 7 courses	4.021	4/60— 7/60 39x	18.425	*5/60— 6/60 11x	5.25	4+ 1:16 CSF_C 5/60	Negative CSF_C 8/63	2,100 3/60	6 8/63	90 3/60	28 8/63	45 3/60	81 8/63	42 (7/60)	14	A
4	45 M C	9/60	9/60— 6/62 5 courses	9.305	9/60— 6/62 74x	72.20	9/60— 7/63 158x	96.70	2+ 1:16 CSF_C 9/60	Negative CSF_C 7/63	330 9/60	13 7/63	452 9/60	58 7/63	26 9/60	70 7/63	37 (12/60)	6	A
5	27 M N	12/59	7/60— 6/62 6 courses	12.10	7/60— 1/61 96x	83.10	8/60— 4/62 91x	61.95	3+ 1:16 CSF_C 7/60	Negative CSF_C 12/63	520 7/60	5 12/63	767 7/60	29 12/63	31 7/60	67 12/63	37 (12/60)	19	A
6	15 M C	12/60	12/60— 6/62 4 courses	7.300	1/61— 2/61 25x	12.50	1/61— 3/61 20x	13.35	Negative CSF_C 12/60	Negative CSF_C 12/63	770 12/60	3 12/63	110 12/60	22 12/63	40 12/60	76 12/63	34 (3/61)	19	A
7	23 F C	7/61	12/60— 4/63 6 courses	8.040	11/61— 1/62 16x	6.40	10/61— 8/62 54x	22.90	4+ 1:2 CSF_C 10/61	Negative CSF_C 6/62	350 10/61	1 1/64	105 10/61	31 1/64	40 10/61	49 1/64	33 (4/61)	9	A
8	17 M C	11/60	4/61— 7/62 4 courses	5.505	3/61—10/62 29x	14.90	3/61—10/62 77x	38.85	3+ 1:4 CSF_C 4/61	Negative CSF_C 12/63	150 1/61	2 12/63	150 1/61	17 12/63	22 1/61	65 12/63	30 (7/61)	15	A
9	38 F C	7/61	7/61— 4/62 4 courses	4.925	7/61— 8/61 14x	5.10	7/61— 9/61 22x	10.00	Negative CSF_C 7/61	Negative CSF_L 2/64	482 7/61	3 2/64	29 7/61	25 2/64	74 7/61	75 2/64	28 (9/61)	21	A
10	42 M C	7/61	8/61—10/62 4 courses	4.080	8/61—11/61 26x	9.80	1/62— 1/62 6x	2.75	Negative CSF_L 8/61	Negative CSF_L 3/63	335 8/61	5 3/63	70 8/61	21 3/63	22 8/61	75 3/63	26 (11/61)	15	A
11	57 M C	8/62	8/62— 1/63 2 courses	4.545	8/62—10/62 28x	11.15	8/62— 6/63 60x	28.55	2+ 1:2 CSF_C 8/62	Negative CSF_C 11/63	137 8/62	4 11/63	40 8/62	22 11/63	55 8/62	67 11/63	12 (2/63)	7	A
12	24 M C	12/62	12/62—4/63 2 courses	3.585	12/62— 3/63 25x	11.25	12/62— 1/64 97x	46.05	3+ 1:4 CSF_C 12/62	Negative CSF_C 1/64	376 12/62	12 1/64	113 12/62	28 1/64	21 12/62	63 1/64	10 (4/63)	1	A
13	19 M M	10/58	10/58—12/61 6 courses	21.69	3/59— 6/63 245x	131.19	8/60— 2/64 168x	95.15	4+ 1:4 CSF_L 3/59	Negative CSF_C 1/64	2,370 3/59	5 1/64	370 3/59	23 1/64	30 3/59	72 1/64	61 (12/58)	Cisternal suppressive therapy being contd.	B
14	55 M C	12/60	1/61—12/62 5 courses	5.920	4/61— 9/61 47x	20.85	4/61— 2/64 167x	74.30	2+ 1:32 CSF_C 4/61	3+ 1:2 CSF_C 1/64	91 4/61	10 1/64	197 4/61	59 1/64	40 4/61	76 1/64	28 (9/61)	"	B
15	54 M N	1/60	1/60— 6/62 5 courses	16.440	1/60—12/61 189x	94.25	4/61— 2/64 174x	85.25	3+ 1:8 CSF_C 4/61	4+ 1:2 CSF_C 1/64	30 4/61	2 1/64	71 4/61	48 1/64	63 4/61	60 1/64	25 (12/61)	"	B
16	59 F C	3/63	3/63— 8/63 1 course	3.345	4/63— 8/63 34x	16.20	4/63— 2/64 65x	31.03	4+ 1:16 CSF_C 4/63	4+ 1:8 CSF_C 1/64	808 4/63	60 1/64	322 4/63	165 1/64	45 4/63	45 1/64	6 (8/63)	"	C
17	44 M C	3/63	4/63— 2/64 2 courses	2.400	8/63—12/63 34x	15.85	9/63—12/63 37x	19.25	2+ 1:8 CSF_C 9/63	4+ 1:4 CSF_C 1/64	302 9/63	53 1/64	88 9/63	118 1/64	42 9/63	62 1/64	Receiving initial intensive treatment		D
18	58 M C	9/63	9/63— 2/64	2.456	10/63—12/63 21x	9.25	10/63— 2/64 35x	19.25	1+ 1:2 CSF_C 10/63	4+ 1:2 CSF_C 1/64	753 10/63	86 1/64	128 10/63	95 1/64	39 10/63	55 1/64	"		D
19	30 M N	1/62	1/62—12/63	8.030	8/62—10/62	6.65	8/62— 2/64	48.50	3+ 1:2	4+ 1:2	277	35	38	30	55	49	Receiving repeated		E

21	11	F	C	3/58	3/58— 5/58 1 course	1.636	4/58— 7/58 46x	21.41			4+ 1:32 CSF_L 3/58	2+ 1:4 CSF_L 8/58	721 3/58	54 8/58	300 3/58	88 8/58	35 3/58	42 8/58	33 (7/58)	Died 4/61 †No supp. therapy	F
22	36	F	M	1/61	4/58— 1/62 5 courses	18.674	1/61— 1/61 14x	7.95	1/61— 6/62 88x	50.40	3+ 1:16 CSF_C 1/61	2+ 1:64 CSF_C 4/63	351 1/61	128 4/63	330 1/61	40 4/63	14 1/61	36 4/63		Died 12/63	F
23	49	M	C	4/59	4/59—10/59 2 courses	3.414	5/59— 6/59 23x	12.60			4+ 1:2 CSF_L 4/59	Negative CSF_L 2/60	735 4/59	82 2/60	480 4/59	165 2/60	28 4/59	81 2/60		Died 3/60	F
24	17	M	M	6/59	7/59—12/61 5 courses	14.115	7/59— 8/61 197x	113.80	8/60— 4/62 88x	56.25	1+ 1:32 CSF_L 7/59	Negative CSF_L 2/63	595 7/59	2 2/63	138 7/59	43 2/63	43 7/59	109 2/63		Died 2/63 (Nephro-toxicity)	G
25	61	M	C	10/56	3/57— 2/58 3 courses	2.387	7/57— 7/57 2x	2.00			4+ 1:32 CSF_L 5/57	4+ 1:32 CSF_L 2/58	106 5/57	97 2/58	224 5/57	185 2/58	58 5/57	47 2/58		Died 2/58 (Coronary thrombosis)	G

*Case No. 3 also received 9.925 mg Amphotericin B intraventricularly (via burr holes) in 23 injections.

†No suppressive therapy followed the initial treatment.

‡As of February 1, 1964.

Explanation of Abbreviations

C=Caucasian. M=Mexican. N=Negro.
CSF_C=Cerebrospinal fluid, cisternal.
CSF_L=Cerebrospinal fluid, lumbar.
CF=Titer of complement fixation (by C. E. Smith, M.D.).
B.T.=Before amphotericin B therapy.
A.T.=At close of period of suppressive outpatient therapy.
Qu. Prot.=Quantitative protein, in mg per 100 ml.
Qu. Gluc.=Quantitative glucose, in mg per 100 ml.
Suppr.=Suppressive.

A=Fully recovered, off all treatment.
B=At home, normal activity or working, under OPD suppressive cisternal therapy.
C=At home, some physical restriction, under OPD suppressive cisternal therapy.
D=In hospital, under primary intensive treatment phase, improving.
E=In hospital, under repeat intensive treatment for relapse, ambulatory.
F=Dead of progressive coccidioidal meningeal disease.
G=Dead, cause other than coccidioidal disease.

after completion of the initial intensive phase of treatment can be sufficiently suppressed and relapse prevented by continued intraspinal injections of amphotericin B into the cisterna magna at intervals of three to seven days. Without such suppressive therapy, given regularly and for sufficient length of time, relapse is likely to occur.

The local inhibitory action of amphotericin B upon *C. immitis* provides sufficient time for the development of adequate immunity by the host that will sustain arrest of the coccidioidal infection after all therapy is stopped. This theory is supported by the study of the patient reported in Appendix C. In that instance complement fixation in the cisternal fluid abated after 26 months of intravenous and intraspinal administration of amphotericin B for severe coccidioidomycosis and coccidioidal meningitis.

Suppressive cisternal injections were then continued in the outpatient department and the patient remained free of meningeal signs and symptoms. However, as a result of the large dose of intravenously administered amphotericin B (21.52 gm), progressive renal failure developed and only successful renal homotransplantation from mother to son prevented his death.[25]

To prevent rejection of the transplanted kidney the patient received Imuran (1-Methyl-4-nitro-5 mimidazolyl thiopurine) and Actinomycin-C for immunosuppression. On January 25, 1963 (approximately 6 weeks after starting Imuran and shortly after starting Actinomycin-C), fever and headache appeared and were associated with changes in the spinal fluid indicative of reactivation of coccidioidal meningitis. The abnormal findings included 25 cells per cu mm of fluid on January 29, 1963, and demonstration of *C. immitis* by culture of spinal fluid on February 27, 1963, and March 7, 1963. Complement fixation which had been absent since March 21, 1961, reappeared in the spinal fluid and the titers reached levels of 1+ in 1:4 dilution in the cisternal fluid on March 11, 1963, and 4+ in 1:4 dilution in the lumbar fluid on March 20, 1963. This reactivation of the coccidioidal meningeal infection was definitely related to the suppression of body immunity by the chemoimmunosuppressive therapy (Imuran and Actinomycin-C), which was necessary to prevent rejection of the transplanted kidney.

Intrathecal amphotericin B therapy was reinstituted on February 6, 1963, and is today being continued by cisternal injections of 0.5 mg once every week. At no time has intravenous amphotericin B been given since the kidney transplant. Cisternal suppressive therapy is to be continued as long as the patient receives immunosuppressive therapy. This plan of treatment has resulted in arrest of the recurrent coccidioidal meningitis and once more there has been reversion of complement fixation in

the cisternal fluid to negative on August 12, 1963, and a return of the other findings in the cisternal fluid toward normal; cell count 20, quantitative protein 27 mg per 100 ml and quantitative sugar 72 mg per 100 ml. Immunosuppressive Imuran therapy (150 mg daily) must be continued to prevent rejection of the transplanted kidney, and suppressive amphotericin B effect maintained by weekly injections of 0.5 mg into the cisterna magna. The patient remains well and has returned to college studies under the protection of this bilateral "chemoantibiotic" suppressive routine. The last examination of the cisternal fluid on January 31, 1964, showed continued absence of complement fixation, five lymphocytes per cu mm, quantitative protein 23 mg per 100 ml and sugar 72 mg per 100 ml.

Fatal Cases

Of the six deaths that occurred, four were related to progressive meningeal disease (Patients 20-23, Table 1), one to nephrotoxicity produced by amphotericin B (Case 24) and one to unrelated coronary heart disease and coronary thrombosis (Case 25).

Of the four patients who died of progressive coccidioidal meningitis, one patient also had microscopic evidence of toxic changes in the kidney[10] after having received a total intravenous dosage of 10.372 gm of amphotericin B. This patient had received no cisternal injections, and lumbar intraspinal therapy had been complicated by repeated bouts of back pain due to subacute arachnoiditis. The present concept of therapy would have provided substitutive suppressive intraspinal therapy for this patient via the cisterna magna and with consequent lowering of the total dosage of intravenous amphotericin B required. Patient Number 21 received insufficient amphotericin B as initial intensive treatment (1.63 gm intravenously and 21.41 mg intraspinally through the lumbar canal). No suppressive therapy was given following discharge from the hospital on August 20, 1958. The lumbar spinal fluid became negative serologically on January 29, 1959, and the other findings then were as follows: Cells 28 per cu mm, quantitative protein 67 mg per 100 ml and sugar 50 mg per 100 ml. The patient remained well at home for 30 months and spinal fluid findings showed maximum improvement on July 19, 1960, when examination showed continued negative serology and the cell count was 4 per cu mm, quantitative protein 32 mg per 100 ml and sugar 55 mg per 100 ml. Impending relapse was partly indicated on January 24, 1961 when the cell count rose to 16 (14 lymphocytes), and headache developed about that time.

By March 14, 1961, complement fixation had returned in the lumbar fluid with a titer of 2+ in 1:4 dilution, and cells increased to 346 per cu mm, quantitative protein rose to 132 mg per 100 ml and sugar fell to 9 mg per 100 ml. The brief cisternal therapy that she received before death amounted to only six injections given in a desperate effort to avert a critical situation. It is believed that this patient would have survived if intensive therapy had been continued longer and suppressive therapy had been maintained afterward.

Patient Number 22 received considerable amphotericin B intravenously (18.674 gms) but only 14 lumbar injections were given due to the early appearance of severe arachnoiditis; cisternal injections of amphotericin B were continued until June, 1962. Regular suppressive intrathecal therapy became impossible thereafter due to a domestic situation and adverse influence of the patient's husband which resulted in frequent interruptions of the treatment program.

The fourth patient, with long-standing meningitis, received insufficient initial intensive treatment and no suppressive intraspinal therapy was given after he left the hospital (Case 23, Table 1). Progressive renal insufficiency developed in one case (Patient 24) after a total of 14.115 gms of amphotericin B had been given intravenously, and the patient died of this cause (Appendix D). The changes in the kidneys have been carefully studied and described by Reynolds, Tomkiewicz, and Dammin.[31] The coccidioidal meningeal infection in this patient had shown complete response to treatment and there was no autopsy evidence of meningeal reactivation. Earlier substitution of suppressive intraspinal therapy would have permitted a lowering of the total dosage of intravenously administered amphotericin B and thereby lessened the toxic changes in the kidney that caused death. Patient Number 13, with a similar history of intensive intravenous therapy and progressive renal impairment following a total dosage of 21.69 gms of amphotericin B, is alive only because of a successful homotransplant of a kidney from his mother. (See Appendix C.) Substitution of regular suppressive intraspinal cisternal injections of amphotericin B would have been important in this patient by lowering the total dosage given intravenously. Patient Number 25, who had received very little intravenous and intraspinal therapy died following coronary thrombosis which was unrelated to treatment.

The considerable tolerance of the subarachnoid tissues to amphotericin B, and to the other ingredients that constitute the commercial preparation Fungizone*, has been demonstrated by long continued injections of 0.5 mg or more into the cisterna mag-

*Each vial contains 50 milligrams of amphotericin B activity combined with 41.0 milligrams of sodium desoxycholate, 10 milligrams of dibasic sodium phosphate, 0.9 milligrams of monobasic sodium phosphate, and 6.2 milligrams of sodium chloride. (E. R. Squibb and Sons.)

na, the lateral brain ventricle and the lumbar canal. With injections in the latter area, however, arachnoiditis does occur with undesirable frequency. Patient Number 13 had received 245 lumbar injections and 168 cisternal injections, and the latter are being continued on a weekly basis. Patient Number 15 received 174 cisternal injections; and patient Number 3, 23 intraventricular injections (Appendix E). In the case of patient Number 24, who had received 197 intraspinal injections into the lumbar area and 88 injections into the cisterna magna, no evidence was noted at autopsy of local irritation of the meninges in the area of the cisterna magna. The tendency for continued amphotericin B injections into the lumbar subarachnoid space to produce irritation is one reason for injecting into the cisterna magna for long term suppressive intraspinal therapy. Our observations in this respect indicate that there is little such irritation produced by amphotericin B administered into the cistern, perhaps because of the greater volume of fluid within this reservoir.

Diagnosis

Meningitis due to coccidioidal infection is often not recognized until the infection has become well established and symptoms demand medical attention. Such presenting symptoms include severe headache, neckache, stupor, nausea, vomiting and fever. Examination of the cerebrospinal fluid, which is usually under increased pressure, will reveal both lymphocytic and granulocytic white cells, low sugar values, elevation of protein and, in most patients, fixation of complement. With the possible exception of those with vertebral coccidioidal abscesses without actual meningeal infection, fixation of complement by spinal fluid is diagnostic of coccidioidal meningitis. However, absence of complement fixation in the presence of increased cells and protein and reduced glucose in the spinal fluid of a person who has or very recently had primary coccidioidomycosis, does not rule out coccidioidal meningitis. Indeed, in about one-fourth of patients with meningeal infection, complement is not fixed by the spinal fluid.[40]

Complement was not fixed by the spinal fluids of three of the present series of patients (Numbers 6, 9, 10). These patients were brought under treatment early in the course of the disease and the diagnosis was based upon other abnormal spinal fluid findings and the history of recent primary coccidioidomycosis. It must be assumed that a prompt beginning of specific therapy made possible by early diagnosis, aborted the development of complement fixation. If intravenous and intrathecal administration of amphotericin B can be started before actual fixation of complement occurs there is greater likelihood that complete arrest of the meningeal infection will result, as occurred in these three patients.

In only six cases in the series of 25 patients was *C. immitis* recovered by culture of the spinal fluid (Numbers 2, 3, 11, 13, 20, 22). For this reason, if a patient with signs and symptoms of meningeal disease has a history of recent primary coccidioidomycosis and there are abnormal findings in the spinal fluid, treatment should not be delayed to await complement fixation within the cerebrospinal fluid.

The insidious onset of coccidioidal meningitis and the paucity of early recognizable symptoms and signs is shown in patient Number 19, who had only a mild backache at the time that examination of the spinal fluid revealed early coccidioidal meningitis. It is important that the physician remain constantly alert to the possibility of meningeal infection with *C. immitis*. When this occurs, it usually takes place one to three months after the illness associated with the primary coccidioidal infection has subsided. The importance of early recognition of coccidioidal meningitis justifies routine lumbar puncture and examination of the spinal fluid at the end of the first, second and fourth months following the onset of primary coccidioidomycosis and whenever clinical recovery seems prolonged. The appearance of headache or neckache, increasing lassitude and drowsiness and low grade fever is indicative of an already established meningeal involvement. Despite the previous administration of intravenous amphotericin B in the treatment of primary coccidioidomycosis, meningeal infection may appear later, after the mildly suppressive action of the intravenously administered antibiotic is no longer present (Cases 7, 13, 19, 24). This is because not enough amphotericin B has passed from the bloodstream and through the meningeal barrier to produce the concentration needed in the spinal fluid for suppression of *C. immitis*.

Early Intensive Treatment

For the initial intensive treatment phase of coccidioidal meningitis, the patient must be put in hospital. Intraspinal injections into the lumbar canal of 0.5 to 0.75 mg of amphotericin B are begun twice weekly, and are alternated with cisternal injections of the same dosage. This treatment plan provides intraspinal administration on four days of each week. Concomitant intravenous therapy is started on a daily basis until the full dosage (1 mg per kg of body weight) is reached, and then continued at 48-hour intervals. (This may be omitted on the day for cisternal injection.) It is desirable to limit the total intravenous dosage to not more than 5 gm of amphotericin B[53] and administration should be guided by frequent renal function appraisals, including determinations of serum creatinine and creatinine clearance. Clearance of endogenous creatinine is a measure of the glomerular filtration rate and offers a reliable means of determining quantitative renal damage. As de-

scribed by Tobias[45] and Tjan[44] and their coworkers, the procedure for determining the rate of creatinine clearance is simpler than that required for inulin clearance and can be carried out in any clinical laboratory. As a means of estimating the degree of toxic suppression of kidney function being produced by intravenously administered amphotericin B, comparative determinations of the creatinine clearance are more accurate than the concentration of blood urea nitrogen or any of the nonprotein nitrogen components of the blood. Falling clearances make it necessary to adjust the dosage and frequency of amphotericin B administration, using temporarily decreased dosage or longer intervals between administration or even short vacations if there is evidence of increasing loss of renal function.

Technique of Amphotericin B Administration

A method for the intravenous administration of amphotericin B to prevent phlebitis and minimize side reactions has been described.[52] With recent but minor modifications, this starts with the addition of 10 cc of sterile distilled water (ampule form, no preservative) to a 50 mg vial of Fungizone (Squibb) which is then shaken until completely dissolved (final dilution 5 mg per ml). A 23 gauge needle is used and introduced into a peripheral vein (Figure 1). A special scalp vein set-up may be used for children or for adults with small venous channels.* The needle is connected to Bottle B (Figure 1) containing 150 ml of 5 per cent dextrose in water. Bottle A containing 500 to 800 ml of 5 per cent dextrose in water, plus the desired dose of amphotericin B (concentration should not exceed 10 mg per 100 ml), is connected by a 20 gauge needle into the terminal portion of the Bottle B tubing. Heparin solution (10 to 20 mg) added to the solution of amphotericin B in Bottle A may prevent phlebitis.

The usual side effects of chilling and febrile reaction, nausea, vomiting and headache related to intravenous administration are most pronounced during the initial treatment period and become less intensive as therapy proceeds. They can be minimized by slow administration of the intravenous suspension of amphotericin B over a four-hour period. Dosage should be started at 10 mg then increased slowly by graduated doses until not more than 1 mg per kg of body weight is reached. The period between intravenous injections can then be lengthened from 24 to 48 hours. Children tend to have less side reactions and may tolerate somewhat higher dosages.

The periodic "cut-off" method of intravenous administration also provides partial control of chills and febrile reactions. Clamp C (Figure 1) is changed by the nurse from the Bottle B to the Bottle A tubing every fifteen minutes for a period of several minutes. Shaking Bottle A during this "cut-off" period prevents the undesirable concentration that might be caused by settling of the colloidal dispersion into the neck of the bottle. This procedure may minimize phlebitis by the "washing out" process that occurs in the vein during the substitution of the flow of the amphotericin B suspension by the 5 per cent dextrose in water solution. If chills, febrile reactions, or nausea develop, the amphotericin B solution may be temporarily stopped and only 5 per cent dextrose in water continued by clamping off the tubing from Bottle A, and thereby permitting Bottle B content to run slowly until the reaction subsides. The amphotericin B solution can then be restarted by changing the clamp back to the C position.

Chills that occur during or following intravenous administration of amphotericin B should also be treated by sustaining body heat (electric blanket or

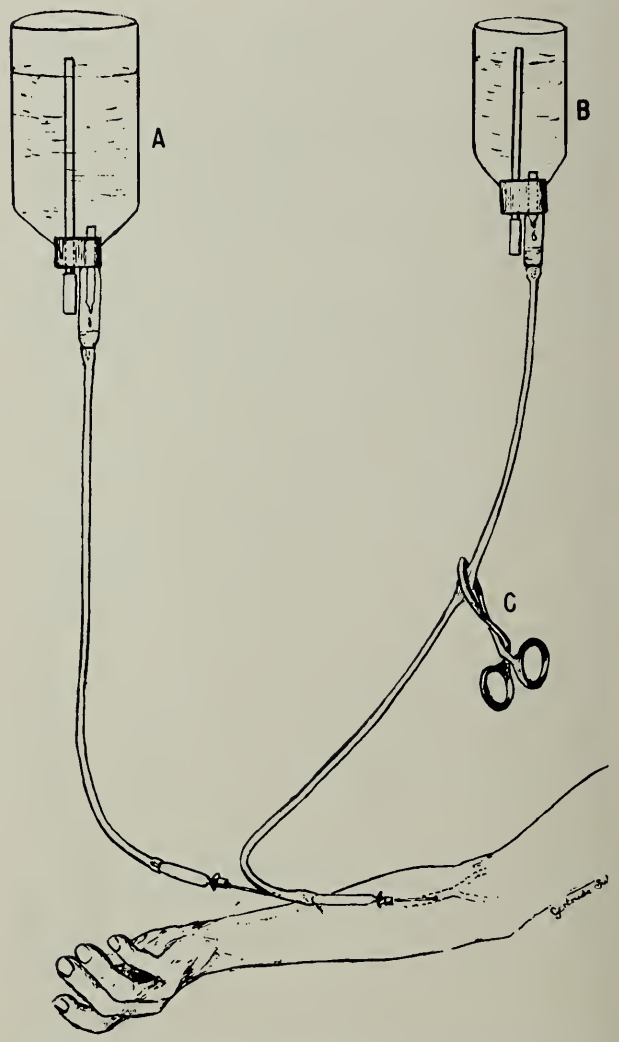


Figure 1.—A method for intravenous administration of amphotericin B.

*This is available from Cutter Laboratories, Berkeley, California.

hot water bottles). Acetylsalicylic acid given by mouth at the start of the intravenous injection may help.

Prevention of side reactions has been effected in variable degree by the administration of hydrocortisone succinate in dosage of 30 to 60 mg for adults. This can be given by intramuscular injection one to two hours before intravenous administration, or within the amphotericin B solution itself (Bottle A in illustration). This salutary corticosteroid effect has also been noted by Saliba and coworkers[35] and Tynes and coworkers.[46]

Our experience would indicate that as long as adequate coverage with amphotericin B is continued, any supposed danger in the combined use of corticosteroids during intravenous amphotericin B therapy of coccidioidomycosis is not borne out. There is increasing evidence that hydrocortisone given intravenously or intramuscularly, or dexamethasone orally, are valuable adjuncts in the treatment of acute or disseminating coccidioidal disease. In patient Number 7, who had very severe and acutely disseminated coccidioidomycosis, it became necessary to continue large daily doses of hydrocortisone succinate (100 to 300 mg) for four months, to the point of decided adrenal suppression, while administering amphotericin B. This was followed by complete recovery from the multisystemic involvement, which included meningitis (Appendix F).

For intraspinal administration of amphotericin B, start by adding 10 ml of sterile distilled water (ampule form, no preservative) to a 50 mg vial of Fungizone (Squibb) and shake well until completely dissolved (final dilution 5 mg per ml). From another 10 ml ampule of sterile distilled water (without preservative), withdraw and measure carefully back into the empty ampule 9.5 ml. To this add 0.5 ml of the above Fungizone solution for the correct concentration (final dilution 0.25 mg per ml). This must be made up fresh each time and with careful technique to avoid bacterial contamination. Intraspinal therapy is started with only 0.1 ml (0.025 mg) of amphotericin B and the amount gradually increased until 2 ml (0.5 mg) can be given without excessive discomfort. This minimal starting amount is important, and the dosage must be increased slowly. Beginning with injections into the lumbar canal seems to increase drug tolerance in the cisternal area; therefore, the first several injections are given at two or three day intervals into the lumbar sac only. Diluting the injection into the lumbar space with six to eight times the volume of spinal fluid may result in better distribution of the antifungal agent into the upper subarachnoid space.[33] Intraspinal therapy via the cisterna magna is started with the same initial dosage of 0.1 ml. At each cisternal injection the solution in the syringe is diluted with twice the volume of cerebrospinal fluid and the mixture injected very slowly.

Lumbar Sites

In the lumbar area the sites of injection are altered, using levels above, even with and below the iliac crest. If back or saddle pain appears, indicating early arachnoiditis, then only cisternal injections are continued. Subacute arachnoiditis which occasionally follows lumbar intrathecal therapy with amphotericin B is indicated by a rise in the cell count and protein values within the lumbar fluid. In these instances a higher pleocytosis and proteinosis is present in the lumbar fluid than in the cisternal fluid.

Since cisternal injections of 0.5 mg of amphotericin B are usually followed by headache of moderate severity, sedation should be given before the procedure starts. Alphaprodine hydrochloride (Nisentil), 40 to 60 mg intramuscularly for adults, is useful in this respect if given 30 minutes beforehand and repeated afterward when headache persists. Following the intracisternal injection, it is advisable for the patient to change his position frequently, and if he wishes he may ambulate. If nausea becomes troublesome, trimethobenzamide hydrochloride (Tigan, 200 mg) or cyclizine (Marezine, 50 mg) may be given intramuscularly.

Intraspinal therapy is designed to bring about reversion of complement fixation within the spinal fluid, or to prevent its appearance in patients who have been serologically negative from the first. When serological improvement has occurred, and there is a return of the quantitative protein, sugar and cell count values toward normal, the patient can be discharged to an outpatient regimen of sustained suppressive cisternal therapy. This consists of the administration of 0.5 mg of amphotericin B into the cisterna magna at intervals of three to seven days. Such therapy is compatible with a return of the patient to his home and resumption of ordinary occupation or school routines. The outpatient regimen should be continued for a while after complement fixation has abated. For example, if the results of two consecutive complement fixation tests of the cisternal fluid a month apart are negative and there has been a return of the cell count, quantitative protein and sugar values toward normal, further cisternal therapy may be discontinued. Medical supervision, including repeated examination of the cerebrospinal fluid, should follow for a period of two to three years, for the coccidioidal infection may reactivate if, for some reason, there is lessening of the patient's immunity.

In our studies of the changes produced in the cisternal and lumbar spinal fluid by coccidioidal infection of the meninges, notable differences have been found between these two fluids with regard to cell count, quantitative protein and sugar determinations.

TABLE 2.—*The Meningeal Reaction to Amphotericin B as Manifested by the Cerebrospinal Fluid Changes (in a Normal Person)*

Day of Treatment	Cerebrospinal Fluid Changes						Amphotericin B (in mg) Injected After Withdrawal of Cerebrospinal Fluid
	Gross Description	Protein (mg per 100 ml)	Glucose (mg per 100 ml)	Cells (per cu mm)	Per Cent Neutrophiles	Per Cent Lymphocytes	
1st	Clear, colorless	30	75	0	0	0	None
2nd	Clear, colorless	30	86	2	0	0	0.025
3rd	Hazy, colorless	122	82	1,080	70	30	0.050
4th	Cloudy, colorless	50	67	737	83	17	0.100
5th	Clear, colorless	38	70	168	57	42	0.200
7th	Faintly hazy, colorless	35	74	58	40	60	0.400
9th	Clear, colorless	34	68	105	50	50	0.750
11th	Hazy, colorless	48	60	704	82	18	1.000
10 days after stopping amphotericin B	Clear, colorless	50	70	26	12	88	None
1 month after stopping amphotericin B	Clear, colorless	35	74	7	1	6	None

There have also been occasional differences in the titer of complement fixation tests done on fluids taken from the two areas on the same day. Therefore, both the cisternal and lumbar fluids are evaluated separately from the standpoint of chemical and cellular reaction and fixation of complement. The cisternal fluid findings appear to be more reliable in this respect and some of the changes in the lumbar fluid are undoubtedly due to the local effect of Fungizone itself, rather than to the infection. This local effect was demonstrated in a healthy control subject, free of any coccidioidal disease, who had normal spinal fluid findings. Following the administration of a small but increasing dosage into the lumbar canal, pronounced cellular and chemical changes occurred in the spinal fluid. These data are presented in Table 2.

Such local effects are not the result of amphotericin B alone, but also relate to the sodium desoxycholate and buffering agents which comprise the commercial preparation Fungizone. Careful consideration is therefore required in evaluating the significance of the protein and cellular response evoked in the spinal fluid by the coccidioidal infection and the effect produced by the therapeutic agent. It becomes necessary to place considerable dependence upon serological testing (complement fixation), which, except for minor variations in the titer, is not influenced by the local irritating effect of the Fungizone solution. Variations from the normal in cell count, sugar and protein determinations are less important, but must also be considered for accurate appraisal of the therapeutic result. As has been suggested by Smith[42] it is the lowering of the complement fixation titer in the spinal fluid (preferably its complete disappearance) that provides the true criterion for estimating the status of a patient with meningitis receiving amphotericin B therapy.

Tulare-Kings Counties Hospital, Springville, California.

APPENDICES

Appendix A. Technique of intrathecal injection into the cisterna magna:

The patient lies on either side with neck flexed and chin against the manubrium. The head is supported on a low pillow so that there is no curvature of the thoracocervical spine. The skin is prepared by shaving the upper neck and raising the base of the hairline posteriorly, then is surgically cleaned and proper drapes applied. The vertebra prominens is identified and 3 to 5 ml of 1 per cent procaine hydrochloride injected just above this and in the midline, not exceeding 3 to 4 cm in depth. A 20 gauge intraspinal needle is introduced along a line of direction between the meatus of the ear and the eyebrow. The depth of the cisterna magna varies from 4 to 7 cm below the skin surface, depending upon the thickness of the neck. As the needle transverses the nuchal ligament it becomes fixed in position and then, as it is slowly advanced it enters the cisternal space with a slight "give."

Appendix B. A 30-year-old Negro was in hospital for five months, receiving 8.030 gm of amphotericin B intravenously for intensive treatment of disseminated coccidioidomycosis (without meningitis). Ten weeks after discharge, although

the patient complained only of a mild backache, routine examination of the spinal fluid was repeated (such examination had been negative on the day of discharge) and the existence of early coccidioidal meningitis confirmed by specific complement fixation of 4+ in 1:2 dilution, the presence of 570 white cells per cu mm, quantitative protein of 66 mg per 100 ml and quantitative sugar 55 mg per 100 ml. He was put in hospital and intravenous amphotericin B started in minimal dosage because of moderate depression of creatinine clearance values and elevation of the blood urea nitrogen. Intrathecal amphotericin B was started into the cisternal and lumbar spaces for a total of 48.5 mg and 6.65 mg respectively. In four months complement fixation within the spinal fluid became negative and he was discharged to outpatient suppressive cisternal therapy. Lack of transportation made attendance irregular for weekly suppressive treatments and therefore he was readmitted. At that time complement fixation was still absent in the spinal fluid but the white cell count had remained at 51, quantitative protein 39 mg per 100 ml and quantitative sugar 55 mg per 100 ml. In the hospital only suppressive cisternal amphotericin B therapy was given weekly for three months and he was again discharged and without continuation of such suppressive treatment. Four months later meningeal symptoms reappeared, including complement fixation in the spinal fluid and the white cell count increased to 187, the quantitative protein rose to 73 mg per 100 ml and the quantitative sugar declined to 45 mg per 100 ml. He has been readmitted and is now receiving both intrathecal and intravenous amphotericin B therapy.

Appendix C. A 23-year-old student of Mexican ancestry had severe primary coccidioidomycosis in October of 1958 and received intravenous amphotericin B. In January, 1959, despite the previous treatment, coccidioidal meningitis developed. In the next three years the patient received a total intravenous dosage of 21.52 gm of amphotericin B until this was stopped in December, 1961. At this time the blood urea nitrogen was 39 mg per 100 ml and the serum creatinine 3.1 mg per 100 ml. In the next six months the renal insufficiency progressed and by June, 1962 the blood urea nitrogen was 110 mg per 100 ml, the serum creatinine 6.3 mg per 100 ml and the patient had developed secondary hypertension. In November, 1962 he was transferred to the Peter Bent Brigham Hospital in Boston to the service of Dr. John P. Merrill, Director, Cardiorenal Section. The blood urea nitrogen had risen to 225 mg per 100 ml and the creatinine to 14.4 mg per 100 ml. On December 12, 1962 the transplantation team at that hospital removed the patient's right kidney and replaced this with a kidney from his mother. Several weeks later the left kidney was also removed (January 10, 1963).[25] At the time of this report which is 14 months from the time of transplantation, the patient's clinical condition remains excellent. On February 7, 1964 the blood urea nitrogen was 17 mg per 100 ml and serum creatinine 0.7 mg per 100 ml. Blood pressure determinations are normal. Suppressive therapy in effect includes Imuran. 150 mg daily, and intrathecal amphotericin B, 0.5 mg, given by injection weekly via the cisterna magna. The toxic renal changes that followed intravenous amphotericin B in this patient have been described.[31]

Appendix D. A 20-year-old Mexican student developed severe primary coccidioidomycosis in May, 1959. In July, 1959 meningeal involvement appeared. The response to intravenous and intrathecal amphotericin B was good but relapse occurred and repeated courses of intravenous therapy were given. The total intravenous dosage reached 14.115 gm by November, 1961. Amphotericin B was then discontinued but in the year following serum creatinine values rose from 2.8 mg to 18 mg per 100 ml. Secondary hypertension appeared and by February, 1963, the blood urea nitrogen had reached a value of 228 mg per 100 ml. Shortly thereafter acute pulmonary edema developed and the patient died.

Appendix E. A seven and one-half year old Mexican-American male developed headache, general malaise and nuchal rigidity in February, 1960 and was admitted to another hospital where spinal fluid examination revealed increased pressure, white blood count 1200 per cu mm (80 per cent lymphocytes), protein of 78 mg per 100 ml and sugar 59 mg per 100 ml. Skin tests were negative to coccidioidin and tuberculin. One month later ventriculographic studies revealed dilated lateral ventricles and a diagnosis of hydrocephalus was made, which was found to be secondary to coccidioidal meningitis after isolation of *C. immitis* from a spinal fluid culture. Specific complement fixation was present in blood serum, ventricular fluid, spinal and cisternal fluid. The patient was then transferred to Tulare-Kings Counties Hospital at Springville for treatment. On admission (March 30, 1960) he was comatose, in opisthotonos, responded to painful stimuli only, and there was total loss of vision. Amphotericin B was started intravenously and supplemented by intrathecal injections into the lumbar canal, the cisternal space and through existing skull burr holes directly into the lateral ventricle. On June 22, 1960 an atrial-ventricular shunt operation was performed because of progressive communicating hydrocephalus. The shunt permitted drainage from the right lateral ventricle via the right facial vein into the right cardiac atrium. On July 7, 1960, intensive therapy was discontinued and followed by suppressive courses of intrathecally and intravenously administered amphotericin B in seven periods, the last ending in November, 1962. On October 18, 1961, blood serum complement fixation had fallen to 4+ in a 1:16 dilution from a high of 4+ in 1:256 dilution on April 26, 1960. On November 10, 1961 the complement fixation within the lumbar fluid had decreased to 2+ in the 1:2 dilution. The patient was discharged to his home on May 29, 1963, after having made remarkable improvement from the initial semicomatose state to a reasonably responsive individual who had only slight mental impairment. When last seen on January 9, 1964 he remained well, showed normal growth, was asymptomatic, and attending school. A partial optic nerve atrophy and resultant partial loss of visual acuity persists. Serological examination of the lumbar and cisternal fluids remains negative and the blood serum titer has dropped to 3+ in 1:4 dilution.

Appendix F. In November, 1960, this 23-year-old white female was in the third trimester of her first pregnancy. At this time she developed cough, fever and general malaise and was admitted to another hospital. Examination revealed a seven-month intrauterine pregnancy and marked splenomegaly: the white blood cell count was 30,000 with 30 per cent eosinophils. Tuberculin and coccidioidin skin tests were negative. On December 21, 1960 spontaneous premature labor occurred and a living infant was delivered that died four hours later. The patient's condition deteriorated rapidly and she became moribund. She was given large doses of hydrocortisone with some improvement. A liver biopsy specimen and sections of the placenta both revealed spherules of *C. immitis*. She was then transferred to this hospital and on admission was found to be dyspneic and severely ill. The white blood cell count had risen to 32,600 and coccidioidal complement fixation was 4+ in 1:128 dilution of the blood serum and precipitins 4+ in undiluted serum. A chest x-ray revealed miliary infiltrate throughout both lung fields. Intensive intravenous amphotericin B therapy was started and hydrocortisone continued (300 mg intramuscularly). The serum coccidioidal complement fixation reached a peak of 3+ in 1:512 dilution on January 13, 1961, and remained elevated until March 16, 1961 when it fell to 2+ in 1:128 dilution. She received 73 intravenous infusions of amphotericin B (total dosage of 3.58 grams). Intravenous and oral potassium chloride was given in large amounts to counteract hypokalemia. Her course in

the hospital was one of gradual improvement with occasional setbacks. Attacks of cardiac asthma occurred during the first month and were related to coccidioidal myocarditis characterized by tachycardia, enlarging heart by x-ray and electrocardiographic changes. The miliary infiltrate of the lungs gradually cleared, but was followed by a left pleuritic effusion on January 30, 1961, which persisted until March. An acute upper gastrointestinal hemorrhage (related to cortisone induced ulceration) occurred on March 10, 1961, and March 23, 1961. She lost 2,500 ml of blood with the first hemorrhage and 1,500 ml with the second. Gradual steroid withdrawal was begun in April and resulted in severe migratory bone and muscle pain and mental depression. On May 4, 1961, the patient complained of headache but the lumbar cerebrospinal fluid was negative on examination. Thoracenteses were performed as needed to control the recurrent pleural effusion. Blood transfusions were used to control the anemia and she received 25 units of whole blood during hospitalization. Almost constant oxygen therapy (tent) was given for the first two months because of persistent tachycardia and dyspnea. The body weight fell to 70 pounds. She was discharged to home care on May 6, 1961, after 133 days in hospital. She was readmitted on May 21, 1961, for 33 additional days of treatment, which consisted of a repeat course of intravenous amphotericin B therapy. The blood urea nitrogen increased from 19 mg to 27 mg per 100 ml. On May 22, 1961, serum complement fixation had fallen to 2+ in 1:32 dilution. She was discharged home on June 23, 1961 after receiving an additional 0.455 gm of amphotericin B. She was readmitted on July 17, 1961 for further evaluation because of severe jaw pain, occasional headache and nausea, and decline of body weight to 62 pounds. Improvement followed and within a month she had regained 7 pounds in weight and could walk unassisted. No additional intravenous amphotericin B was given and she was again discharged to her home on September 8, 1961. The serum complement fixation fell to 2+ in 1:8 dilution. On October 18, 1961 she complained of headache which persisted for several days and then became quite severe and was associated with vomiting. She was readmitted on October 24, 1961, appeared moderately ill and had nuchal rigidity. Examination of the spinal fluid revealed 463 white cells (83 per cent lymphocytes) per cu mm, a quantitative protein of 124 mg per 100 ml and quantitative sugar 28 mg per 100 ml. Complement became fixed 4+ in 1:2 dilution of cisternal fluid on October 30, 1961. A diagnosis of coccidioidal meningitis was made. Intravenous and lumbar intrathecal amphotericin B were started on October 27, 1961, and cisternal injections added on November 2, 1961. On November 21, 1961 dexamethasone 0.5 mg three times a day was added to the treatment regimen, and this served to decrease the side reactions produced by the intravenous injections. The patient showed evidence of slow improvement. In November, 1961, complement fixation in the cisternal fluid reached a peak of 2+ in 1:4 dilution and in the lumbar fluid 3+ in 1:4 dilution. On January 3, 1962, lumbar instillations were stopped but cisternal injections continued on a biweekly basis. She was discharged from the hospital on February 28, 1962, after examination of the cisternal fluid on February 26, 1962, disclosed: Cells 9, protein 43 mg per 100 ml, sugar 57 mg per 100 ml, and complement fixation 4+ in 1:2 dilution. During hospitalization she had received a total of 21.425 mg of amphotericin B intrathecally, and 8.040 gm intravenously. As an outpatient she continued to receive cisternal injections of amphotericin B on a weekly basis as a suppressive routine. The cisternal fluid became serologically negative on June 29, 1962, followed by the lumbar fluid on July 16, 1962. The blood serum complement fixation fell to 4+ in 1:4 dilution. At the last follow-up examination on January 22, 1964, the lumbar fluid remained serologically negative and no other abnormal findings were present. In summation: From December, 1960 to April, 1963, the patient received six courses of amphotericin B for a total dosage of 8.04 gm intravenously; from November, 1961, to January, 1962 she received 16 lumbar injections for a total of 6.4 mg, and from October, 1961, to August, 1962, she received 54 cisternal injections for a total dosage of 22.9 mg. There is no evidence of permanent renal damage. At present she is working in San Francisco as a secretary-clerk, is in good health and leads an active social life without physical restriction.

REFERENCES

1. Abernathy, R. S., and Jansen, G. T.: Therapy with amphotericin B in North American blastomycosis, Ann. Int. Med., 53:1196-1203, 1960.

2. Appelbaum, E., and Shtokalko, S.: Cryptococcus meningitis arrested with amphotericin B, Ann. Int. Med., 47:346-351, 1957.

3. Baum, G. L., Schwarz, J., and Wang, C. J. K.: Treatment of experimental histoplasmosis with amphotericin B, Arch. Int. Med., 101:84-86, 1957.

4. Beard, H. W., Richert, J. H., and Taylor, R. R.: The treatment of deep mycotic infections with amphotericin B, Am. Rev. Resp. Dis., 81:43-51, 1960.

5. Bell, N. H., Andriole, V. T., Sabesin, S. M., and Utz, J. P.: On the nephrotoxicity of amphotericin B in man, Am. J. Med., 33:64-69, 1962.

6. Campbell, C. C.: The accuracy of serologic methods in diagnosis, Ann. N. Y. Acad. Sci., 89:163-177, 1960.

7. Castellot, J. J., Pitts, F. W., and Mowrey, F. H.: A case of coccidioidal meningitis arrested by prolonged therapy with intravenous amphotericin B, Antibio. Med. & Clin. Ther., 6:480-485, 1959.

8. Colwell, J. A.: Remission in disseminated coccidioidomycosis produced by amphotericin B, Ann. Int. Med., 50:1028-1035, 1959.

9. Dalldorf, G.: Fungi and Fungous Diseases, Chapter XX, Charles C. Thomas, Publisher, Springfield, Ill., 1962.

10. Dammin, G. J.: Written communication, Oct. 7, 1963.

11. Einstein, H. E., Holeman, C. W. Jr., Sandidge, L. L., and Holden, D. H.: Coccidioidal meningitis—The use of amphotericin B in treatment, Calif. Med., 94:339-343, 1961.

12. Findlay, C. W. Jr., and Kleinfeld, G.: Monilial empyema treated successfully with intrapleural instillations of amphotericin B., J. Thor. & Cardio. Surg., 38:244-247, 1959.

13. Furcolow, M. L.: The use of amphotericin B in blastomycosis, cryptococcosis and histoplasmosis, Med. Clin. N. Am., 47:1119-1130, 1963.

14. Gantz, J. A., Nuetzel, J. A., and Keller, L. B.: Cryptococcal meningitis treated with amphotericin B, Arch. Int. Med., 102:795-800, 1958.

15. Goldman, H. J., Littman, M. L., Oppenheimer, G. D., and Glickman, S. I.: Monilial cystitis—Effective treatment with instillations of amphotericin B, J.A.M.A., 174:359-362, 1960.

16. Harrell, E. R., and Curtis, A. C.: The treatment of North American blastomycosis with amphotericin B, Arch. Derm., 76:561-569, 1957.

17. Holeman, C. W. Jr., and Einstein, H.: The toxic effects of amphotericin B in man, Calif. Med., 99:90-93, 1963.

18. Jenkins, V. E., and Postlewaiter, J. C.: Coccidioidal meningitis: Report of four cases with necropsy findings in three cases, Ann. Int. Med., 35:1068, 1951.

19. Klapper, M. S., Smith, D. T., and Conant, N. F.: Disseminated coccidioidomycosis apparently cured with amphotericin B, J.A.M.A., 167:463-466, 1958.

20. Littman, M. L.: Preliminary observations on the intravenous use of amphotericin B, an antifungal antibiotic, in the therapy of acute and chronic coccidioidal osteomyelitis, Proceedings of Symposium on Coccidioidomycosis, U.S. Pub. Health Bull., No. 575, pp. 86-94, 1957.

21. Littman, M. L., Horowitz, P. L., and Swadey, J. G.: Coccidioidomycosis and its treatment with amphotericin B, Am. J. Med., 24:568-592, 1958.

22. Lones, G. W., and Peacock, C. L.: Alterations in *Candida albicans* during growth in the presence of amphotericin B, Antibio. & Chemother., 9:535-540, 1959.

23. Louria, D. B., Feder, N., and Emmons, C. W.: Amphotericin B in experimental histoplasmosis and cryptococcosis, Antibio. Ann., 1956-1957, pp. 870-877, N. Y., 1957, Medical Encyclopedia, Inc.

24. Louria, D. B., and Dineen, P.: Amphotericin B in treatment of disseminated moniliasis, J.A.M.A., 174:273-279, 1960.

25. Murray, J. E., Merrill, J. P., Harrison, J. H., Wilson, R. E., and Dammin, G. J.: Prolonged survival of human-kidney homografts by immunosuppressive drug therapy, New Eng. J. Med., 268:1315-1323, 1963.

26. Newcomer, V. D., Sternberg, T. W., Wright, E. T., and Reisner, R. M.: Current status of amphotericin B in the treatment of the systemic fungous infections, J. Chron. Dis., 9:353-374, 1959.

27. Newcomer, V. D., Sternberg, T. H., Wright, E. T., Reisner, R. M., McNall, E. G., and Sorensen, L. J.: The treatment of systemic fungous infections with amphotericin B, N.Y. Acad. Sci., 89:221-239, 1960.

28. Norman, D. D., and Miller, Z. R.: Coccidioidomycosis of the central nervous system, a case of ten years duration, Neurol., 4:713, 1954.

29. Parrillo, O. J., Meiberger, M., and Elston, H.: Candida meningitis complicating Hodgkin's Disease, J.A.M.A., 182:189-191, 1962.

30. Procknow, J. J., and Loosli, C. G.: Treatment of the deep mycoses, Arch. Int. Med., 101:765-802, 1958.

31. Reynolds, E. S., Tomkiewicz, Z. M., and Dammin, G. J.: The renal lesion related to amphotericin B treatment for coccidioidomycosis, Med. Clin. N. Am., 47:1149-1154, 1963.

32. Rhoades, E. R., Ginn, H. E., Muchmore, H. G., Smith, W. O., and Hammarsten, J. F.: The effect of amphotericin B upon renal function in man, Antimicro. Agents Ann., pp. 539-542, 1960.

33. Rieselbach, R. E., Di Chiro, G., Freireich, E. J., and Rall, D. P.: Subarachnoid distribution of drugs after lumbar injection, New Eng. J. Med., 267:1273-1278, 1962.

34. Rosen, E., and Belber, J. P.: Coccidioidal meningitis of long duration: Report of a case of four years and eight months with necropsy findings, Ann. Int. Med., 34:796, 1951.

35. Saliba, A., and Beatty, O. A.: Treatment of mycotic infections: Hydrocortisone in the control of amphotericin B toxicity, Dis. Chest, 41:214-219, 1962.

36. Sanford, W. G., Rasch, J. R., and Stonehill, R. B.: A therapeutic dilemma—The treatment of disseminated coccidioidomycosis with amphotericin B, Ann. Int. Med., 56:553-563, 1962.

37. Seabury, J. H., and Dascomb, H. E.: Experience with amphotericin B for the treatment of systemic mycoses, Arch. Int. Med., 102:960-976, 1958.

38. Seabury, J. H., and Dascomb, H. E.: Experience with amphotericin B, Ann. N.Y. Acad. Sci., 89:202-220, 1960.

39. Shurtleff, D. B., Peterson, W., and Sherris, J. C.: Systemic *Candida tropicalis* infection treated with amphotericin B, New Eng. J. Med., 269:1112-1115, 1963.

40. Smith, C. E., Saito, M. T., and Simons, S. A.: Pattern of 39,500 serologic tests in coccidioidomycosis, J.A.M.A., 160:546-552, 1956.

41. Smith, C. E.: Personal communication.

42. Smith, C. E.: Personal communication.

43. Smith, D. E., and Matthews, J. H.: Treatment of pulmonary mycotic infections with amphotericin B, New Eng. J. Med., 263:782-784, 1960.

44. Tjan, H. L., Tobias, G. J., Levin, R., and Hopper, J. Jr.: Creatinine clearance in clinical medicine, Calif. Med., 98:121-128, 1963.

45. Tobias, G. J., McLaughlin, R. F. Jr., and Hopper, J. Jr.: Endogenous creatinine clearance. A valuable clinical test of glomerular filtration and a prognostic guide in chronic renal disease, New Eng. J. Med., 266:317-323, 1962.

46. Tynes, B. S., Utz, J. P., Bennett, J. E., and Alling, D. W.: Reducing amphotericin B reactions, Am. Rev. Resp. Dis., 87:264-268, 1963.

47. Utz, J. P., Louria, D. B., Feder, N., Emons, C. W., and McCullough, N. B.: A report of clinical studies on the use of amphotericin B in patients with systemic fungal diseases, Antibio. Ann. 1957-1958, pp. 65-70, N. Y., 1958, Med. Encyclopedia, Inc.

48. Utz, J. P., and Treger, A.: The current status of chemotherapy of systemic fungal disease, Ann. Int. Med., 51:1220-1229, 1959.

49. Wertlake, P. T., Butler, W. T., Hill, G. J. II, and Utz, J. P.: Nephrotoxic tubular damage and calcium deposition following amphotericin B therapy, Am. J. Path., 43:449-457, 1963.

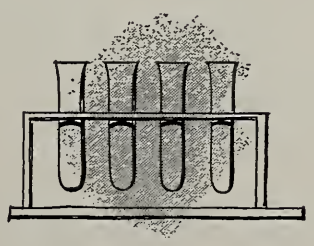
50. Wilson, J. W.: Therapy of systemic fungous infections in 1961, Arch. Int. Med., 108:292-316, 1961.

51. Windom, R. E., Sanford, J. P., Pritchard, J. A., Abernathy, R. S., and Muchmore, H. G.: The hematotoxicity of amphotericin B, to be published.

52. Winn, W. A.: The use of amphotericin B in the treatment of coccidioidal disease, Am. J. Med., 27:617-635, 1959.

53. Winn, W. A.: Coccidioidomycosis and amphotericin B, Med. Clin. N. Am., 47:1131-1148, 1963.

54. Winn, W. A.: Diagnosis and treatment of coccidioidomycosis, Ariz. Med., 19:211-217, 1962.



The Immunology of Allergy

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■ *The symptomatic treatment of allergic disorders is of major importance but more profound benefits can be obtained by understanding and applying the immunologic principles involved in allergic diseases.*

Immediate hypersensitivity diseases such as hay fever and asthma are the result of a combination of allergic antibody and allergens. The chemical mediators liberated by this union produce tissue effects resulting in the manifestation of allergic symptoms.

Specific hyposensitization treatment alters the allergic immunologic reaction pattern.

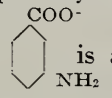
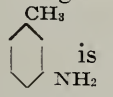
THE UNION of antigen and antibody is a marriage of fundamental importance to all of us in both health and disease. In hypersensitivity states we are not especially concerned about the participants in this marriage—rather it is the side effects of this union which are of utmost importance. The aspect of a protective nature of the immune response is obvious: A noxious substance is neutralized in one way or another; the emphasis is on the antigen and what happens to it. In the hypersensitivity diseases, the spotlight is on the tissues and how they are affected by the antigen-antibody reaction. Immunologic principles and mechanisms are the core of understanding and treating allergic diseases. Each year, the term *allergy* assumes broader meaning to encompass all those conditions characterized by increased reactivity. Although the present communication is directed toward the so-called atopic diseases, the underlying immunologic principles are applicable to other hypersensitivity diseases.

Guest Speaker's Address: Presented before a Joint Meeting of the Sections on Allergy and Internal Medicine with the California Thoracic Society, the California Chapter of American College of Chest Physicians and the California Society of Allergy at the 93rd Annual Session of the California Medical Association, Los Angeles, March 22-25, 1964.

Review of Principles of Immunology

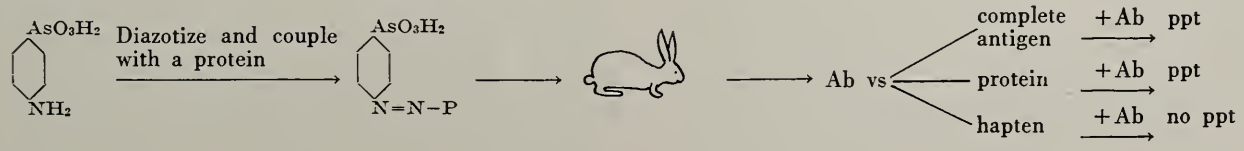
A review of immunologic principles is essential before discussion of clinical allergy problems such as bronchial asthma. Let us begin with the initial provoking substance: Antigen. As there are several types of antigen, definitions are in order. A *complete antigen* is a substance which incites the formation of antibody and reacts specifically with it. A *hapten*

(also called *incomplete antigen* or *determinant group*) is a substance which reacts specifically with an antibody but by itself cannot elicit antibody formation. The term *allergen* is applied to those antigens which are associated with clinical allergic response. *Heterogenetic antigens* occur in more than one species; for example, the Forssman antigen found in kidney, sheep red blood cells and bacteria. *Species-specific antigens* occur in all animals of a species—for example, mouse globulin. *Iso-antigens* occur in some members of a species—for example, blood group antigen. Antigens specific for an organ—for example, lens antigen—are called *organ-specific antigens*. An *auto-antigen* is peculiar to one individual.

What makes an antigen antigenic? It is determinant groups which are specific reactive patches on antigens. These chemical determinant groups confer antigenicity through their structure, especially polar groupings. A negative charge or polarity is most important for antigenicity. Thus,  is a good antigen but  is poorly antigenic. This may be illustrated by pneumococcus polysaccharide which is poorly antigenic when there is an alcohol end group; however, a carboxyl end group is sufficiently antigenic to produce complete immunity in an exposed animal. Antigens may include animal material, plants, proteins, carbohydrates, lipids, organic or inorganic compounds; concomitantly the molecular weight varies greatly and generally includes the range from about 20,000 to several million. Antigens often exhibit diversity; for example, a protein antigen molecule with perhaps more than 1,500 amino acids may have many different determinant groups and thus a number of different antibodies may be evoked by this one "purified" antigen.

Specificity is a rigid property of both antigens and antibodies. In fact, this is probably the most outstanding and important feature of immunologic phenomena. Cross-reactions occur because antigens may have the same or similar determinant groups, for example, the cross-reactivity exhibited between horse serum and horse danders or pneumococcus and tomato. Landsteiner pointed out the specificity of serological reactions through his scheme of:

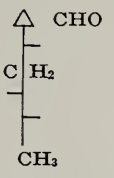
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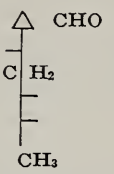
(2)

Inhibition test: Ag + Ab ⟶ ppt
(Ag + Hapten) + Ab ⟶ no ppt

He showed that specificity varies with minor changes in the chemical determinant group: Length of side chain, position of side chain, position of double bond, cis and trans compounds, spatial configuration, crystal structure. This, of course, is of great clinical importance: For example, a virus may change a determinant grouping by mutation and a previously effective vaccine may be useful no longer. A simple example of determinant group specificity is the difference between Salmonella paratyphi B and C.



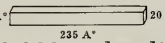
ABEQUOSE SUGAR
(S. PARA. B)



TYVELOSE SUGAR
(S. PARA. C)

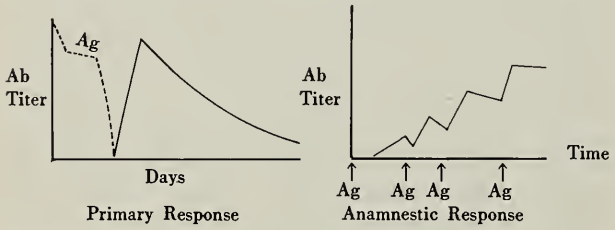
The definition of an antibody is linked to the definition of antigen. Thus, an antibody is a serum globulin evoked by antigen and reacts specifically with it. Currently there are three basic theories concerning the mechanism of antibody formation. To understand these, one must assume that the shape of ribonucleic acid (RNA) template determines the configuration of the specific globulin pattern of an antibody. Also it must be noted that desoxyribonucleic acid (DNA) is self-replicating but RNA is not. The Direct Template Theory assumes antigen directly alters RNA; it follows that antigen must be present continually throughout antibody formation. The Indirect Template Theory states that antigen enters the nucleus and affects DNA which in turn alters the RNA template. The Clonal Selection Theory states that DNA affects RNA; DNA configuration may be changed by mutation and this occurs frequently in early embryonic life; antigen selects then stimulates proliferation of the precursor cell which has the appropriate RNA template.

The important physical and chemical properties of antibodies are as follows. They are usually a gamma globulin though reaginic activity has been reported in beta globulin fractions. Antibodies are not "modified" gamma globulins but are formed *de novo* from amino acids. However, there is no physicochemical difference between antibodies and gamma globulins except for the unique property of antibod-

ies combining with antigens. So-called "normal antibodies" are those formed due to environmental exposure and it has been shown that animals living in a germ-free environment have decreased gamma globulin levels. The usual antibodies in humans are globular proteins 

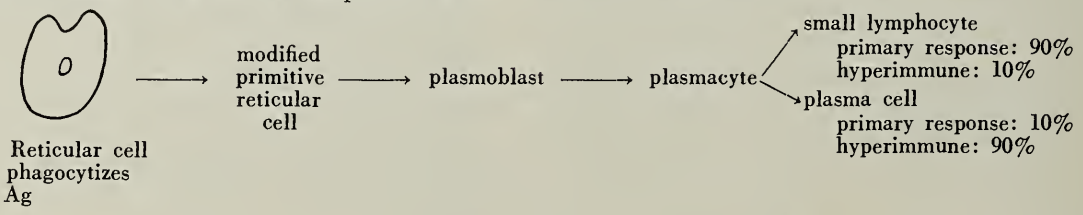
, have molecular weights of about 150,000 and sedimentation rates of 7 (however, Wasserman antibodies have a molecular weight of 1,000,000 and sedimentation rate of 19) and have two reactive sites where they combine with antigen; these reactive sites appear to have a positive charge, are not necessarily symmetrically distributed (which may account for so-called univalent antibodies), and may be as large as six sugar molecules. Most antibodies are relatively heat-stable; the important exception is the allergic antibody, reagin.

There are certain important characteristics of the antibody response. The induction period is defined as the time from administration of antigen to appearance of circulating antibody. Initially, or in the primary response, this takes four to ten days. With each successive administration of antigen there is an anamnestic response manifest by shorter induction periods, higher antibody peaks, faster rise in antibody appearance and greater persistence of antibody. This may be graphed as follows:



It is of clinical importance that a secondary response to one antigen decreases a simultaneous primary immune response to another antigen; hence one should not start a course of immunization to one antigen while the patient is still undergoing active immunization to another antigen.

Antibodies are synthesized in lymph nodes, spleen and lymphoid tissue. The cellular sequence is as follows:



Good has shown in a normal child of an hypogammaglobulinemic mother that antibody is not produced until the fortieth day after birth and the normal range of antibody levels is not attained until the age of four months. Certain situations can interfere with the usual formation of antibodies. The antibody response can be increased by adjuvants such as alum, water-in-oil emulsions and gram-negative organisms. Antibody formation may be depressed by irradiation, steroids and certain antimetabolite drugs.

The union of antigen and antibody generally occurs in two phases. The first or "union phase" is the combination of multivalent antigen and bivalent antibody in a loose and disorganized fashion. This phase is characterized by rapidity and non-visibility. Subsequently there is reorganization and formation of lattices or aggregates, and the second or "visualization phase" is slow and manifest by visible particles. The combination of antigen and antibody is specific, firm, and completely reversible. Antibodies are often designated in terms of the test used to show that an antigen-antibody reaction has occurred. Agglutination occurs when large particulate antigens are used. The typing of blood is a good example of this test. The phenomenon of precipitation is utilized in such techniques as gel diffusion and the antibodies are then referred to as precipitins. The fixation of complement enzymes occurs in many antigen-antibody reactions and this is used as an indicator of combination. Blocking of a demonstrable antigen-antibody reaction is the basis of such tests as the Coombs test in which the usual agglutination of Rh positive red blood cells by anti-Rh positive serum is prevented by previous exposure of the cells to another non-agglutinating antibody.

Allergic reactions may be divided into two broad categories of hypersensitivity: Delayed and immediate. Delayed hypersensitivity includes the tuberculin type and contact type of immune reactions and the term implies that the clinical reaction occurs hours or days after antigenic challenge. It has not been conclusively proved that antibody participates in delayed hypersensitivity but numerous characteristics of the reaction strongly invoke antibody formation and the experiments of Dienes and Salvin even suggest that delayed hypersensitivity is an early phase in the evolution of immediate hypersensitivity. Delayed hypersensitivity is characterized by generalized reactions with lesions not restricted to particular tissues, a cellular reaction of mononuclear cells, and transfer of sensitivity only through sensitized leukocytes. Infectious hypersensitivity, contact dermatitis and certain autoimmune diseases are clinical manifestations of delayed hypersensitivity.

The common allergic diseases such as allergic bronchial asthma, hay fever, urticaria and atopic eczema or hypersensitivity reactions to drugs, vac-

cines, insect stings or blood transfusions are the clinical manifestations of immediate hypersensitivity. This state is characterized by a causal relationship to humoral antibodies and rapid manifestations which are the results of changes that occur in blood vessels, smooth muscle and connective tissue. The sequence of events is sensitization by exposure to antigen with resultant antibody formation. The antibodies both circulate and affix themselves to certain cells. Upon challenge with antigen, there is union of antigen and antibody and subsequent reactive effects on tissue cells either directly by a precipitate of antigen and antibody, cytotoxic effects of a soluble complex of antigen and antibody formed in an excess of antigen, or through liberation of pharmacologically active mediator substances which then affect certain tissues. The result is that cells respond hyperactively in normal function and thus secrete more, or contract more, or perhaps change their permeability. The sum of all these hyperfunctioning reactions exceeds physiological limits, producing a disease syndrome not related to the nature of the antigen but dependent on the host's reactivity.

There are few subjects as intriguing to the allergist as the nature and the significance of antibodies. It is here that the uniqueness of atopy comes forth. Reagin, which is better called "atopic skin sensitizing antibody," is the peculiar circulating antibody which appears to be primarily responsible for the allergic reaction. In general, the higher the titer of skin sensitizing antibody, the higher the degree of symptoms. Our knowledge of it is somewhat sparse since it is so difficult to isolate and our only standard method of detecting it is by bioassay on human skin. Consequently, physico-chemical studies on atopic skin sensitizing antibody are somewhat conflicting but our current concept is that it is a $beta_2$ A globulin (that is, $gamma_1$ A), with a sedimentation rate between 7 and 19 and a probable molecular weight in the range between 160,000 and 1,000,000. Recent studies suggest that atopic skin sensitizing antibody can be split into two polypeptide chains, of which only one has reaginic activity. The immune aspects of skin sensitizing antibody are better known and these characteristics set it apart from usual antibodies: (1) it is more heat labile than any other known antibody, (2) it has a great affinity for becoming fixed to skin and this is the basis for the passive transfer or Prausnitz-Kustner test, (3) it does not cross the placental barrier, a property that is shared with only a few other antibodies such as Rh hemagglutinating antibody, (4) it appears to be selectively secreted in saliva and sputum, (5) it will release histamine from sensitized blood. Important negative properties of skin sensitizing antibody are: It is non-precipitating, irregularly fixes complement, will not agglutinate, does not co-precipitate, and fails to produce passive cutaneous anaphylaxis in experimental animals. To some investigators *reagin* implies an hereditary atopic antibody. Yet it can be found in animals—in a dog with ragweed hay fever, for example—and it can be experimentally induced in humans to such antigens as Ascaris worm, diphtheria toxoid and ragweed allergen.

There has been recent interest in hemagglutinating antibodies found in atopic sera. These antibodies agglutinate red blood cells which have been coated with an allergen such as ragweed. It has been shown that hemagglutinating antibodies are present in the sera of both untreated and hyposensitized allergic patients although titers are generally increased in those having had specific treatment. These antibodies have properties similar to those of usual antibodies. Hemagglutinating antibodies may possibly be related to blocking antibodies but there is no correlation with skin sensitizing antibodies and their importance in clinical allergy is not known.

The last type of antibody to be considered in atopic persons is "blocking antibody," the development of which is the one definite immunologic change that occurs when allergic patients are treated by injections of allergenic extracts. Significant titers of blocking antibody have been shown conclusively only in treated patients. Characteristics of blocking antibody are like those of ordinary antibodies: It is thermostable and found in the gamma globulin fraction of serum; it circulates in the blood but does not attach to cells: it crosses the placental barrier and can be induced in non-allergic persons by injections of allergenic extracts. However, blocking antibody does not precipitate, or fix complement or produce passive cutaneous anaphylaxis. Blocking antibody is so named because it effectively blocks the reaction between skin sensitizing antibody and allergen; this it does through its outstanding characteristic of great avidity for the allergen so that it preferentially combines with allergen in the presence of skin sensitizing antibody. Fortunately the union of allergen and blocking antibody does not give rise to allergic symptoms and it is this peculiarity which led to its discovery. It was initially detected in the sera of specifically treated atopic patients when it was noted that transfusion of blood from these treated patients into symptomatic untreated individuals gave temporary relief from allergic symptoms. It is tempting to assume that blocking antibody is the protective factor but, in general, the titer of blocking antibody is not related to the patient's therapeutic response and the clinical importance of blocking antibody has not been determined.

The offending substances in clinical allergy are called allergens and this appears to be a good term, for they are weak antigens in the immunologic sense. They may include common and uncommon foods,

pollens, ordinary house dust, common and ubiquitous fungi, animal danders, feathers and even insect debris. Sensitization to these ordinary substances in nature is immunologically specific, and it is brought about by repeated exposure through inhalation, contact or ingestion. The antigenic fractions of these substances have not been accurately defined but some information is available. For example, house dust allergen is a combination of polypeptides and polysaccharides with the latter predominating and accounting for allergenicity. Much work has been directed to ragweed allergen and there appear to be up to ten antigens which are important; they are composed of peptide material.

Although an immediate hypersensitivity reaction may be the result of direct tissue effect by antigen-antibody complex in certain cases, the manifestations of clinical allergic reaction appear to be due to the effect of chemical mediators on "shock organs" such as the lungs. It is reasonable that one of the earliest results of the union of antigen with antibody is a rather specialized form of damage to cells which leads to activation of enzymes and subsequent freeing or formation of substances having pharmacologic activity. One of the most studied and the most active substances is histamine. It is a metabolite formed from histidine by decarboxylation and is found in mast cells and basophiles. Administration of histamine reproduces many of the manifestations of the allergic reaction; for example, it causes severe spasm of the smooth muscles of the bronchioles. Experimentally, when the lung of a pollen-sensitive human is exposed to the pollen, contraction of bronchi occurs and histamine is released. However, other *in vitro* studies of sensitized smooth muscle in a bath show that when the muscle has been fatigued to the point of no longer contracting after repeated stimulations with histamine, the addition of specific antigen to the bath will cause additional muscular contraction. Thus, histamine is an important mediator but other substances must be considered. Serotonin is important in the anaphylactic reaction of certain species, such as the rabbit, but it is not related to human allergic reactions. Acetylcholine has been implicated since it affects both glandular activity and bronchial tone; however, there is no objective information available of its secretion in immediate hypersensitivity reactions. Acetylcholine is thought to be important in one clinical situation — the triad of aspirin-sensitivity, asthma and nasal polyposis. The administration of even minute amounts of acetylsalicylic acid to the individual results in immediate severe cyanotic asthma which is due primarily to pronounced contraction of bronchial muscle; however, other forms of salicylate such as the sodium salt produce no reaction. It is thought that this is not an immunologic problem but rather a genetic enzyme defect in the detoxification of acetyl radicles, permitting them to accumulate and tie up the cholinesterase system. The importance of complement and anaphylatoxin in human allergy is not apparent. Plasma "kinins" are polypeptides formed by enzyme action on plasma proteins and cause increased capillary permeability in certain species. Bradykinin is a low molecular weight, heat-stable, dialyzable polypeptide formed by enzyme digestion of beta globulin. It appears in dog serum during anaphylaxis but that it is important in human hypersensitivity reactions has not yet been confirmed. Similarly, other permeability factors have been considered; for example, Miles permeability factor has 2,000 times the potency of histamine but its significance in human allergy is unknown. Nevertheless, conditions favorable for these substances occur in tissue and the kind of effect which these substances can produce fits readily into the clinical picture. Protease activity is found in the serum during anaphylactic reactions but it is not known whether this is a cause or result of the reaction. A carbohydrate coming from human lung tissue itself following antigen-antibody reaction has been studied by Brocklehurst and termed *Slow Reacting Substance A*. This substance can cause contraction of normal human bronchioles *in vitro*. It is suggested that human allergic reactions are acutely related to histamine and probably prolonged by other mediators. Thus, in bronchial asthma, the bronchospasm could be accounted for by histamine and Slow Reactive Substance A, while plasma kinins and permeability factors supplement these mediators in causing bronchial edema and increased glandular activity.

The practice of clinical allergy is the application of immunologic principles. Offending allergens must be identified and if avoidance is not feasible, then hyposensitization treatment with specific allergens is indicated. It is readily admitted that our present state of knowledge concerning the effects of hyposensitization treatment is meager but the results of such treatment are often gratifying. Injections of extracts of specific allergens generally result in decreased reactivity which may be related to a reduction in skin sensitizing antibody or perhaps formation of a protective factor such as blocking antibody. Certainly symptomatic treatment is necessary but all too often it may be inadequate in itself and there is progression of symptoms. A case in point is the huge complex of bronchial asthma. Many factors, often non-specific, may precipitate asthmatic episodes but the key to successful treatment is determining etiological factors. Not all asthma is immunologic in nature but antigen-antibody reactions are so frequently a major or contributing cause that we should always seriously consider them.

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Variations of the Platelet Count in Disease

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■ *Platelet counts were obtained in 675 patients with different hematological and other medical disorders. An indirect venous blood dry slide method which gave a normal range of 200 to 400 × 10^3 per cu mm was used. Platelet counts varied considerably in disease: In 20 patients, exclusive of myeloproliferative disorders, platelet counts in excess of 1,000 × 10^3 per cu mm were observed; in 20 patients, exclusive of leukemia and megaloblastic anemia, platelet counts were below 100 × 10^3 per cu mm. In general, platelet counts varied with the leukocyte count, but not with the degree of anemia.*

THE PLATELET count has a relatively narrow range in normal persons but it varies considerably in disease. Thrombocytopenia may be idiopathic or secondary.[7,11] Secondary thrombocytopenia may be caused by injury to the megakaryocytes by drugs, chemicals and x-ray, or by replacement of marrow with leukemia, lymphoma, metastatic carcinoma or fibrosis. It may also occur in the megaloblastic anemias and in hypersplenic states such as Gaucher's disease. Destruction of platelets may result from immunologic reactions to drugs, foods and chemicals. Hayem,[12] in 1882, described thrombocytopenia in the acute stages of infectious disease, followed by thrombocytosis when the patient was recovering. Similar observations have been reported in influenza,[10] pneumonia,[17] typhus,[18] and several other acute infections.[21] Thrombocytosis occurs in the myeloproliferative disorders, in the postsplenectomy state and after acute blood loss, and has been reported on rare occasions in chronic infections such as tuberculosis,[3,8] staphylococcal and streptococcal osteomyelitis and empyema.[22] Elevated counts have also been noted in association with carcinoma,[13] surgical operation,[6] iron deficiency anemia,[21] fractures,[9] acute rheumatic fever,[16] suppurative infections[16] and parturition.[9]

Apparently many disorders can affect the platelet count. The reported variations have not been uni-

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form. The data on platelet counts are difficult to interpret because they consist of small bits of information gathered by many observers using different counting techniques. In this report the platelet counts in various disease categories, determined under standardized conditions, are recorded.

Methods and Materials

Study Group: Platelet counts were done in 675 patients seen by the Hematology Consultation Service on the medical wards of the San Francisco General Hospital between 1957 and 1962. The patients were grouped by clinical categories, as follows: Acute blood loss, cancer, cirrhosis of the liver, hemolytic anemia, iron deficiency anemia, infection, myeloproliferative diseases (chronic granulocytic leukemia, polycythemia vera and myelofibrosis), megaloblastic anemia, renal disease, rheumatoid arthritis, tuberculosis, undiagnosed anemia and miscellaneous conditions. In each group, patients with normal, low and high platelets were compared with respect to age, hemoglobin concentration, packed cell volume, and red and white blood cell counts. Patients with drug-induced thrombocytopenia or idiopathic thrombocytopenia and acute leukemia were excluded from the study.

Hematologic determinations were performed by standard methods. Bone marrow specimens, obtained by aspiration, were stained for hemosiderin by the Prussian Blue reaction. Special hematologic tests and other ancillary studies were performed when necessary for diagnosis.

Platelet counts were done by the indirect venous blood dry slide method of Aggeler and Corey.[1,2] Approximately 1 ml of blood was aspirated into a syringe containing 1 ml of Tocantins' citrate-formaldehyde mixture.* The contents of the syringe was thoroughly mixed and placed in a small stoppered vial. After the contents of the vial had been thoroughly mixed, a small drop of the specimen was transferred to each of two clean glass slides with a wooden applicator or glass rod. Thin blood films were prepared in the usual manner and stained with Wright's stain. The number of platelets per 1,000 erythrocytes on each of the two smears was counted under oil immersion (970 ×) magnification and bright field illumination. The results were averaged, multiplied by the erythrocyte count per cu mm, and divided by 1,000 to obtain the platelet count per cu mm. The erythrocyte count was determined on an independent venous blood sample mixed with dry double oxalate (Wintrobe).

In ordinary blood smears stained with Wright's stain the individual platelets appear to be divided

*Neutral formaldehyde, Baker-Adams reagent grade, Code 1178, 36% by weight, 0.22 ml; sodium citrate, 38%, 10 ml; distilled water to make 100 ml.

TABLE 1.—*Variations in the Platelet Count Related to the Mean Age, Hemoglobin Concentration, Red Cell Count, Packed Cell Volume and White Cell Count in Various Disease Categories*

Clinical Category	< 200 platelets × 10^3 per cu mm (mean values)					200 - 400 platelets × 10^3 per cu mm (mean values)					> 400 platelets × 10^3 per cu mm (mean values)							
	No. of Patients	Age (years)	Hemoglobin (gm per 100 ml)	Red Blood Cells (10^6 per cu mm)	Packed Cell Volume (per cent)	White Blood Cells (10^3 per cu mm)	No. of Patients	Age (years)	Hemoglobin (gm per 100 ml)	Red Blood Cells (10^6 per cu mm)	Packed Cell Volume (per cent)	White Blood Cells (10^3 per cu mm)	No. of Patients	Age (years)	Hemoglobin (gm per 100 ml)	Red Blood Cells (10^6 per cu mm)	Packed Cell Volume (per cent)	White Blood Cells (10^3 per cu mm)
Acute blood loss	5	67	8.0	2.7	24.3	8.9	12	59	8.4	2.9	25.1	7.8	9	62	7.6	2.5	22.9	11.4
Cancer	20	64	9.1	3.0	31.0	33.8	31	63	10.1	3.7	33.0	19.1	18	69	8.8	3.5	30.3	19.7
Cirrhosis of liver	31	53	9.7	3.0	31.6	7.4	25	52	8.9	2.8	29.2	11.5	40	52	9.1	2.9	29.8	12.6
Hemolytic anemia	---	---	---	---	---	---	9	26	9.1	3.5	27.0	11.1	13	24	8.4	3.2	25.2	22.8
Iron deficiency anemia	18	57	8.8	3.9	28.8	6.8	57	55	7.1	3.2	22.4	8.7	95	46	7.4	3.5	24.1	10.8
Infectious diseases	15	49	9.9	3.4	32.1	10.4	24	52	10.1	3.6	30.8	11.1	42	52	8.9	3.4	29.9	14.6
Megaloblastic anemia	34	67	6.0	1.6	19.0	4.9	14	59	7.2	1.7	21.8	6.8	7	62	5.9	1.7	20.2	6.2
Myeloproliferative diseases	10	55	11.4	3.8	33.4	16.8	21	59	15.9	5.3	48.0	14.9	11	54	14.6	4.9	43.5	26.4
Renal disease	10	63	7.6	2.7	21.5	11.3	16	51	7.6	2.9	22.9	7.5	10	59	7.0	2.5	21.0	11.5
Tuberculosis	---	---	---	---	---	---	4	60	9.7	3.7	32.0	7.2	9	57	9.8	3.6	32.4	12.8

into two zones: The outer clear blue hyalomere and the inner chromomere made up of purple staining granules. When blood is immediately fixed with formalin on leaving the circulation, as in the method used in this study, the granules are evenly distributed throughout the platelet. When only a few granules are present the platelet may be identified by the faint outline of its body which stains a light buff color.

Results

The range of platelet counts in patients in the various categories is shown in Chart 1. Variations in the count related to the mean age, hemoglobin concentration, red cell count, packed cell volume and white cell count in various disease categories are shown in Table 1.

Normal values. The normal values for this method established by Aggeler and Corey in studies on 100 male and female hospital personnel between the ages of 21 and 60 years were: Mean 294 $\times$ 10^3 per cu mm, standard deviation (S.D.) 66 $\times$ 10^3 per cu mm, normal range (mean $\pm$ 2 S.D.) 161 $\times$ 10^3 per cu mm to 426 $\times$ 10^3 per cu mm. To determine whether the same values were applicable to the predominantly aged patient population examined in this study, platelet counts were carried out on 30 patients without apparent disease who were in hospital for custodial care before being transferred to a nursing home. The mean for this group was 314 $\times$ 10^3 per cu mm, with a standard deviation of 44 $\times$ 10^3 per cu mm. The normal range (mean $\pm$ 2 S.D.) was 226 to 402 $\times$ 10^3 per cu mm. For ease of analysis, the normal range for the platelet count was considered to be 200 to 400 $\times$ 10^3 per cu mm (see Chart 1).

Acute loss of blood. There were 26 patients with acute massive loss of blood. Twenty-three of them had bled from the gastrointestinal tract, two had menorrhagia and one had severe epistaxis. Twelve patients were seen within 36 hours of the acute bleeding episode; only one had an elevated platelet count. The remaining 14 were seen 36 hours or more after the episode, and eight had elevated counts. One patient seen three hours after occurrence of the acute bleeding had a platelet count of 150 $\times$ 10^3 per cu mm; a second count eight days later was 500 $\times$ 10^3 per cu mm. A second patient seen within 24 hours had a count of 250 $\times$ 10^3 per cu mm, which rose to 1,000 $\times$ 10^3 per cu mm by the tenth day.

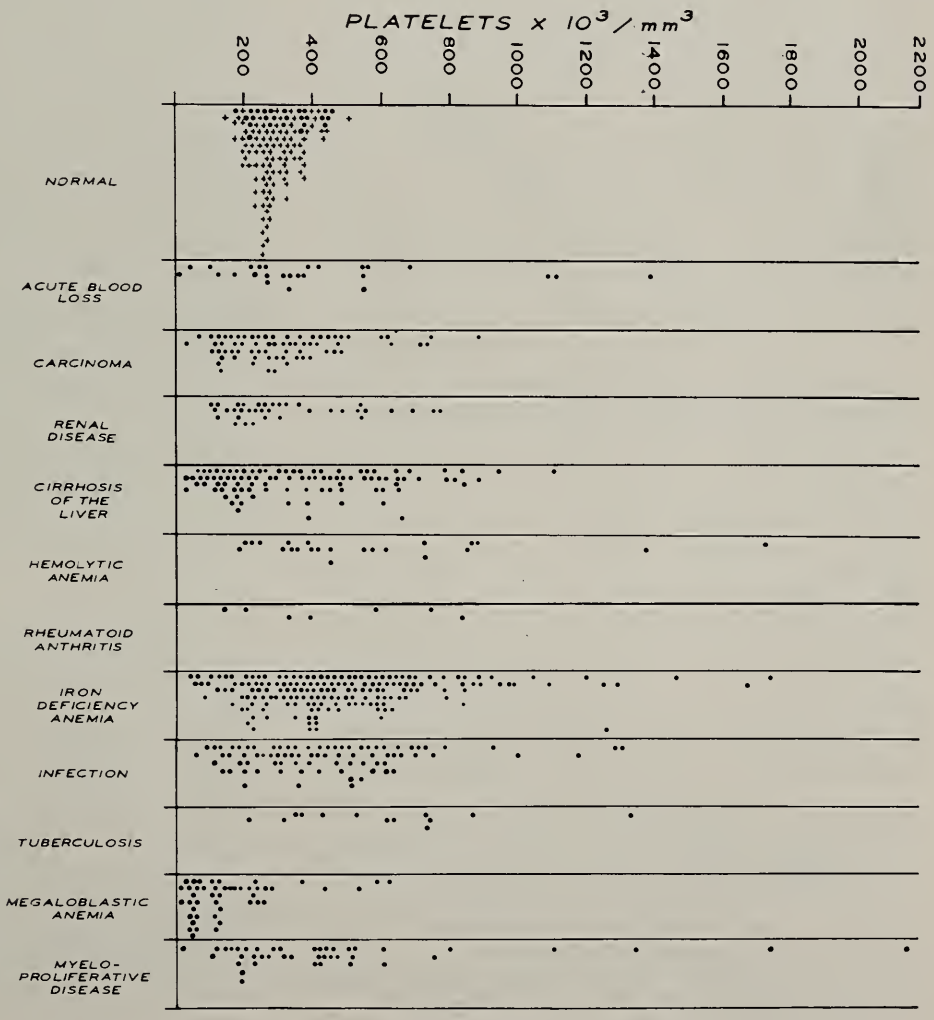


Chart 1.—The range of platelet counts in 130 normal subjects and in 675 patients with various diseases. The normal group consisted of the original 100 subjects of Aggeler and Corey[2] and 30 elderly custodial patients without apparent disease seen at the San Francisco General Hospital.

A third had a count of 550 × 10^3 per cu mm on the third day after the acute episode with a rise to 1,100 × 10^3 per cu mm on the seventeenth day.

Cancer. There were 69 patients with various types of malignant disease, including carcinoma of the lung, breast, prostate, esophagus, larynx, colon, bladder, ovary, parotid, stomach and kidney, multiple myeloma, Hodgkin's disease, lymphosarcoma and chronic lymphocytic leukemia. The presence or absence of metastasis did not appear to influence the number of platelets. The highest platelet counts were found in patients with carcinoma of the lung and breast and in Hodgkin's disease.

The mean leukocyte count was significantly higher (P = 0.05*) in the patients with low platelet counts than in the patients with normal or high counts. This is the opposite from what was observed in all other groups in this study; the majority of patients with chronic lymphocytic leukemia characteristically have low platelet counts. When patients with chronic lymphocytic leukemia were excluded from the calculations, the mean white counts in the groups with high and normal platelet counts were then significantly greater than those in the group with low platelet counts (P = 0.05)

*Probability of accidental occurrence is less than 5 per cent.

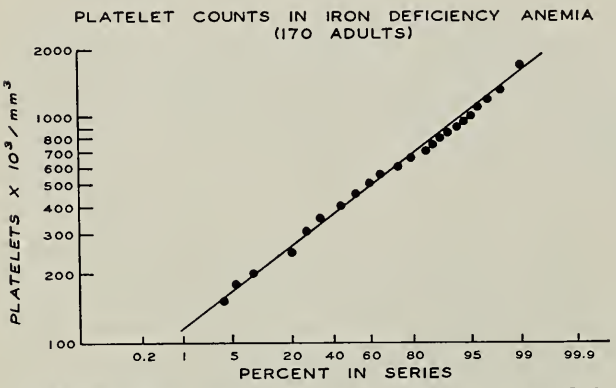


Chart 2.—Distribution of platelet counts in iron deficiency anemia.

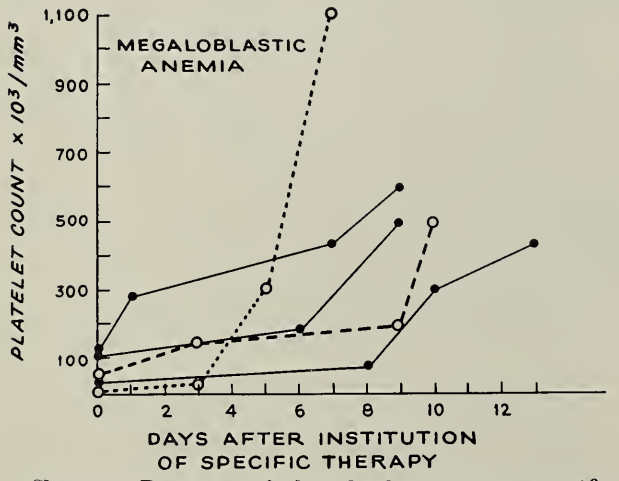


Chart 3.—Response of the platelet count to specific therapy of megaloblastic anemia in five patients.

Cirrhosis of the liver. There were 96 patients in this group. Of the 31 patients with subnormal counts, 24 had portal hypertension as manifested by a palpable spleen or esophageal varices. There was no relationship between the severity of the cirrhosis, as determined by liver function tests or biopsy, and the platelet count.

Hemolytic anemia. Twenty-three patients had hemolytic anemia of various types. Thirteen had hemoglobinopathic conditions (sickle cell anemia in nine, S-C disease in two, and thalassemia minor in two), one had hereditary spherocytosis, three had glucose-6-phosphate dehydrogenase deficiency, four had Coombs-positive autoimmune hemolytic anemia and two had drug-induced acute hemolytic anemia.

Iron deficiency anemia. There were 170 cases of iron deficiency anemia. None of the patients had obvious recent bleeding. In eight of the 170 patients (4.7 per cent) the counts were above 1,000 × 10^3 per cu mm (see Chart 2).

Infection. Eighty-one patients had various types of acute infectious diseases, including acute pyelonephritis, staphylococcal septicemia, infected decubitus ulcers, pneumonia, wound infections, typhoid, menininginitis, lung abscess, pelvic inflammatory disease, brucellosis, streptococcal pharyngitis and infectious mononucleosis.

Bacterial pneumonia was the most frequently encountered acute infection (21 patients). The platelet counts in these patients ranged from 50 × 10^3 per cu mm to 987 × 10^3 per cu mm (mean 428 × 10^3 per cu mm). Patients seen during the first two days after entering hospital had low or normal counts. Those studied on the third hospital day or later had normal or elevated counts.

Megaloblastic anemia. A total of 55 patients had megaloblastic anemia, 31 due to deficiency of folic acid and 24 to deficiency of vitamin B_{12}. All patients were seen before institution of specific therapy and had frankly megaloblastic bone marrow when the platelet counts were recorded.

Although thrombocytopenia usually occurs in megaloblastic anemia, a portion of the patients in this series had a slight increase in platelet count when first seen. That thrombocytosis ordinarily occurs in response to specific therapy can be seen in Chart 3. As shown, the platelet count rises slowly during the first five or six days of treatment and then increases sharply to supernormal levels.

Myeloproliferative diseases. In this group were 42 patients with polycythemia vera, chronic granulocytic leukemia and idiopathic myelofibrosis. In the group with low platelet counts, the mean hemoglobin concentration, red cell count and packed cell volume

were lower than those of the patients with normal or high platelet counts.

Renal disease. Thirty-six patients had chronic renal failure and azotemia due to chronic pyelonephritis, diabetic nephrosclerosis, chronic glomerulonephritis, hypertensive nephrosclerosis or obstructive uropathy secondary to benign prostatic hypertrophy or ureteral calculi. No apparent relationship could be found between the platelet count and the degree of azotemia.

Rheumatoid arthritis. There were seven patients with rheumatoid arthritis. One of the two patients with subnormal platelet counts had Felty's syndrome (rheumatoid arthritis, splenomegaly and lymphadenopathy).

Tuberculosis. Thirteen cases of active pulmonary tuberculosis were studied.

Miscellaneous. Platelet counts in the following infrequently encountered diseases are given in thousands per cu mm: Disseminated lupus erythematosus (three cases) 216, 281, 360; hereditary elliptocytosis (two cases) 381 and 278; lead poisoning (one case) 450; myxedema (two cases) 230 and 225; osteomyelitis (one case) 758; panhypopituitarism (one case) 588; rheumatic fever (one case) 578; sarcoidosis (one case) 857; scurvy (two cases) 168 and 220; Wegner's granulomatosis (one case) 675.

When patients with low, normal and high platelet counts were compared with respect to age, hemoglobin concentration, red blood cell count, packed cell volume and white blood cell count, it was noted that high platelet and high white counts tended to occur together. The white count difference between the high and normal platelet group was statistically significant ($P = 0.05$). None of the other variables were significantly different between the groups.

Examination of the bone marrow specimens showed that patients with thrombocytopenia usually had either normal or decreased numbers of megakaryocytes, whereas those with high platelet counts tended to have megakaryocytic hyperplasia.

Discussion

The indirect dry slide method of platelet counting used in this study has certain advantages over direct chamber methods. Identification of platelets is more reliable because microscopic objectives giving higher magnification and greater resolution can be employed and no special equipment is required. The actual counting of platelets need not be done immediately but may be deferred to a more convenient time. If there is any question regarding the accuracy of the count, it can be repeated from the original slide. Despite these obvious practical advantages, indirect platelet counts have fallen into disrepute because of inadequacies of previous methods. Indirect counts done on dry smears of unfixed blood such as are prepared for the leukocyte differential count are undoubtedly highly inaccurate; the platelets frequently appear in clumps, and large aggregates are particularly noticeable when the platelet count is high. However, when the blood is immediately fixed with formalin, as in the method used in this study, platelets do not agglutinate; not even two platelets are ever found adherent to each other, regardless of the height of the count.

The use of venous blood for platelet counts in the manner described here eliminates many sources of error inherent in all capillary blood methods, such as clumping and adhesion of platelets to skin and glassware, admixture of tissue juices, introduction of disintegrated products of crushed or injured cells and sampling errors caused by temporal variations in the proportion of platelets to erythrocytes within the capillaries. It also allows for proper mixing of the specimen just before making any preparation for platelet counting. Furthermore, it has been demonstrated that in this method the platelets and erythrocytes maintain a homogenous distribution in the two main steps of the procedure. In a study by Aggeler and Corey,[2] a single blood specimen was obtained from each of ten normal subjects; with each specimen platelet counts were done in each of ten widely separated areas on the same slide and in one closely similar area on each of ten different slides. Only a small variation in the ratio of platelets to erythrocytes was found. By the first method the mean platelet count was 315×10^3 per cu mm with a standard deviation of 27.5×10^3 per cu mm and by the second method the mean was 330×10^3 per cu mm with a standard deviation of 29×10^3 per cu mm.

The bone marrow data obtained in this study suggests that the moderate thrombocytopenia observed in a proportion of patients with a variety of secondary diseases may be caused either by suppression of platelet maturation or by destruction of megakaryocytes or platelets, or both.

The narrow range of the platelet count in health suggests a regulating mechanism. Craddock and associates[5] showed that the platelet pool in the body is quite limited and that a thrombocytosis implies increased platelet production. In contrast, granulocytosis appears to result from accelerated release of cells from the marrow reserves or redistribution of cells sequestered in capillary beds.[4]

The present study shows that many diseases may alter the platelet count and that both abnormally low and high counts may be found in the same disease. Duke[8] wrote in 1915: "In many diseases, substances are formed which act as either irritants or poisons to the platelet forming organs and depending on the

intensity of their action, may exert their influence either to increase the count or reduce it." Animal experiments show that thrombocytosis can be induced by the injection of diphtheria toxin, benzol, bacterial emulsions and radiation. The same agents, when used in larger doses, can cause profound thrombocytopenia.[8,20] Humoral factors stimulating thrombopoiesis may exist. Schulman and associates[19] described a patient with a congenital thrombopenia who showed a rise in platelets after the administration of normal human plasma. Thrombopoietic substances have been demonstrated in the sera of patients with polycythemia vera,[15] in patients with acute loss of blood[14,23] and after splenectomy.[14] Similar factors may have been present in the sera of patients with the wide variety of diseases presented here. The levels of thrombopoietic components in plasma may rise in response to tissue injury. The resultant platelet count may depend upon the relative activity of these substances and the antagonistic effect on the marrow of the basic disease or its toxins. This may explain why patients with acute infectious disease often have low or normal counts early in the course of their illness, but high counts during recovery.

This study shows good correlation between the level of the platelet count and the white count, but none between the platelet count and the degree of anemia. A single agent may exert regulatory control over both leukopoiesis and thrombopoiesis, or multiple factors may be present that affect each cell type independently. Alternatively, the observed leukocytosis may be merely a redistribution phenomenon and not represent an increase in granulopoiesis. It is possible, however, that tissue damage is the common denominator stimulating the release of both thrombocyte and leukocyte stimulating factors.

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REFERENCES

1. Aggeler, P. M.: Blood platelets: A critical analysis of various methods of enumeration. In Cowdry, E. V.: Laboratory Technique in Biology and Medicine, Ed. 4, Baltimore, Williams & Wilkins Co., (in press).

2. Aggeler, P. M., and Corey, D. L.: The enumeration of blood platelets: A critical investigation of various methods, including techniques utilizing oil immersion phase contrast microscopy and shallow counting chambers, Unpublished report, Radiological Laboratory, Department of Radiology, University of California School of Medicine, San Francisco, 1955.

3. Bannerman, R. G.: Blood-platelet counts in pulmonary tuberculosis, Lancet, 2:593-595, 1924.

4. Craddock, C. G., Jr., Perry, S., and Lawrence, J. S.: Control of the steady state proliferation of leukocytes. In Stohlman, F., Jr.: The Kinetics of Cellular Proliferation, New York, Grune & Stratton, Inc., 1959, pp. 242-259.

5. Craddock, C. G., Jr., Adams, W. S., Perry, S., and Lawrence, J. S.: The dynamics of platelet production as studied by a depletion technique in normal and irradiated dogs, J. Lab. & Clin. Med., 45:906-919, 1955.

6. Dawbarn, R. Y., Earlam, F., and Evans, W. H.: The relation of the blood platelets to thrombosis after operation and parturition, J. Path. & Bact., 31:833-873, 1928.

7. Doan, C. A., Bouroncle, B. A., and Wiseman, B. K.: Idiopathic and secondary thrombocytopenic purpura: Clinical study and evaluation of 381 cases over a period of 28 years, Ann. Int. Med., 53:861-876, 1960.

8. Duke, W. W.: Variation in the platelet count: Its cause and clinical significance, J.A.M.A., 65:1600-1607, 1915.

9. Galloway, J. F.: The blood platelets after fracture, Lancet, 1:1082-1083, 1931.

10. Gram, H. C.: The blood-platelets in influenza, with remarks on the technic of counting, Acta med. scandinav., 54:1-16, 1920.

11. Harrington, W. J., Minnich, V., and Arimura, G.: The autoimmune thrombocytopenias. In Tocantins, L. M.: Progress in Hematology. New York, Grune & Stratton, Inc., 1956, pp. 166-192.

12. Hayem, G., quoted by Tocantins, L. M. (21)

13. Jarcho, S.: Diffusely infiltrative carcinoma, Arch. Path., 22:674-696, 1936.

14. Kelemen, E., Lehoczky, D., Cserháti, I., Krizsa, F., and Rák, K.: Demonstrability of a serum factor inducing thrombocytosis prior to acute rises of platelets in mice and men, Acta haemat., 29:16-26, 1963.

15. Linman, J. W., Bethell, F. H., and Long, M. J.: Factors controlling hemopoiesis: Experimental observations on their role in polycythemia vera, Ann. Int. Med., 51:1003-1018, 1959.

16. Mackay, W.: The blood platelet: Its clinical significance, Quart. J. Med., 24:285-328, 1931.

17. Reimann, H. A.: The blood platelets in pneumococcus infections, J. Exper. Med., 40:553-565, 1924.

18. Reimann, H. A., Lu, G. Y. C., and Yang, C. S.: The blood platelets in typhus fever, Arch. Path., 7:640-645, 1929.

19. Schulman, I., Pierce, M., Lukens, A., and Currimbhoy, Z.: Studies on thrombopoiesis. I. A factor in normal human plasma required for platelet production; chronic thrombocytopenia due to its deficiency, Blood, 16:943-957, 1960.

20. Steiner, P. E., and Gunn, F. D.: The response of blood platelets to external stimuli: Ultraviolet light, iodine and coal tar, Arch. Path., 11:241-254, 1931.

21. Tocantins, L. M.: The mammalian blood platelet in health and disease, Medicine, 17:155-260, 1938.

22. Wright, J. H., and Kinnicutt, R.: A new method of counting the blood platelets for clinical purposes, J.A.M.A., 56:1457-1459, 1911.

23. Yamamoto, S.: Mechanism of the development of thrombocytosis due to bleeding, Acta haemat. jap., 20:163-178, 1957.



Occupational Health

Its Role in Environmental Health Programs

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■ *An important part of the practice of occupational medicine is directed toward the control of the industrial, physical, chemical and biological environments which may adversely affect health. This concern with the effect of environment on health has moved out of industry and has become a major area of public health practice, as evidenced by interest in pesticides, air pollution and radioactive fallout.*

The discipline of occupational health is a natural resource and springboard for the development of the skills necessary to control these environmental hazards. Occupational health is supplying trained and experienced personnel in the applied technical and administrative phases. It also can provide a basis for graduate teaching and research programs in environmental health. At the University of California's School of Public Health in Berkeley, curricula are being developed for educating teachers and research personnel in the environmental health sciences.

ALTHOUGH THE TITLE of this article indicates that occupational health and environmental health are related but separate fields, neither is clearly delineated. Both are still in a state of flux and their boundaries are ill-defined. They frequently overlap and are often inseparable. A part, but certainly not all, of occupational health is environmental health, but there are many areas which are nearly identical. In these specific areas, occupational health may be considered a specialized and limited aspect of environmental health. Or, looked at from another viewpoint, environmental health may be considered an extension of specific areas of occupational health. No matter where the emphasis is placed, the role of occupational health in environmental health programs can be described: It is to provide a portion of the central structure of essential administrative skills, scientific techniques, trained manpower and educational opportunities for research and practice in environmental health which are necessary for its future growth.

Expansion of the areas encompassed by occupational health is the history of this specialty. It has been called by various names: Industrial surgery, industrial medicine, industrial hygiene, occupational

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hygiene, occupational medicine, adult health, and others. The semantic variety underscores the major forces that have shaped the practice and still remain the dominant interest of the occupational physician; but they also describe the close relationship between occupational health and environmental health. I would like, first, to describe briefly the trends and current status of occupational health and then to suggest the role that it may play in our burgeoning environmental health programs.

Surgical and medical care were supported by industry before the turn of the century because of the inadequacy of doctors, hospitals and nurses in the remote areas where industry was being established, such as lumber and railroad camps and mining operations. Physicians were imported to these locations to provide for workers and their families. With the advent and growth of the workmen's compensation laws from about 1910, legal responsibility was placed on industry to provide care for workers injured in its employ. This further promoted the development of the practice of industrial medicine. Soon the practice became preventive in nature because the economic losses caused by work-connected injuries and illnesses could be minimized most effectively by preemployment examinations, accident prevention and occupational disease control. The industrial hygiene engineer became a vital force in the occupational health team.

There is no real difference in the care of ill or injured persons whether the cost be borne by industry or not. If a patient is an industrial responsibility, the difference which exists between his care and that for any other patient is in the administrative relationship between the patient, the physician, and the company. This relationship involves payment of fees, submission of reports, knowledge of special conditions, and the like. As a practical matter the industrial physician soon became a full-time employee with responsibility for the administrative functions of management which relate to health. This job has been increasing in complexity as labor unions, government agencies, practicing physicians and official and nonofficial health organizations have become involved in these relationships. Administrative health practices —all the various factors which have a bearing on health but which do not involve the direct professional care of the patient by the doctor— are a major function in the practice of occupational health.

World War I brought into focus and emphasized another activity of the industrial hygienist and the industrial physician—namely, control of the occupational environment, especially as it concerns hazardous conditions and toxic chemicals. While occupational disease has been known since antiquity, growth in the use of chemicals in industry during and after World War I accentuated and accelerated exposure to many new hazards. Along with the recognition of the immediate injuries produced by typical poisons came understanding of the more subtle effects produced by chronic exposure to toxic chemicals such as benzol. This phase of occupational health has grown for other reasons as well, such as the liberalization of workmen's compensation laws in interpreting what constitutes occupational illness, the introduction of many new chemicals and processes, the demands of the American worker for a more healthful working environment and the technical advances in instrumentation, air analysis and control.

World War II expanded another area of preventive medicine for the industrial physician. His experience in physical examinations for workmen's compensation purposes was a precursor to the broader concept of a health examination before employment and periodically during the worker's productive years. The growth of this phase of occupational health was enhanced by the labor shortage and wage freeze of World War II which accentuated management's and labor's interest in health and medical care matters. In recent years the physical examination program has been expanded in scope as well as in purpose.

In summary, the major functions of occupational health can be characterized as (1) administration of worker health practices, (2) preventive medicine based primarily on first aid and physical examination programs, and (3) environmental control of chemical, physical and mechanical hazards.

But occupational health as conceived by the founders of this specialty of practice has grown very slowly during this past decade if measured by conventional standards such as the number of practitioners, the number of graduate students and the volume of literature. Cogent reasons for this seeming inertia may be found within the framework of its own practice, but other reasons due to changes in our society have occurred outside its boundaries.

Occupational health really embraces two dynamic forces, the expansion of our industrial economy and advances in our knowledge of preventive medical and health practices. Industrialization has created problems outside the plant as well as within. By providing a basis for a better standard of living, industrialization has brought with it an unprecedented population growth and concentration of peoples in and around cities. This has multiplied the problem of keeping the environment habitable, and the practice of occupational health has moved subtly from within the plant to outside.

It is estimated that between five hundred and two thousand new products, including pesticides and detergents, are created by industry each year, many of them carrying with them health-related problems outside the plant. Other technological developments, such as radiation, add to the burden of environmental

health. Management faces greater problems in the use of its products in the community than it does in protecting the health of the worker during the manufacturing process. A prime example is the automobile. Highway accidents and contamination by automobile exhaust gases offer far greater potential for harm than the mechanical and toxic hazards in the manufacture of the vehicle.

Another development in the past decade has been the change in agriculture, which is rapidly becoming similar to other industries. The word *agri-industry* has been coined to describe these developments. While the number of persons employed on farms is decreasing both absolutely and proportionately, the decline is greater in family workers than in hired hands. In California for instance, two-thirds of farm workers are employees rather than members of family farm units. In spite of the insistence on unskilled laborers by many farmers, mechanization and industrialization is moving ahead rapidly. Technological advances make it possible for a farm operator to cultivate increasingly larger acreage with fewer manhours by use of mechanical devices and chemicals almost as diverse as those used by small manufacturers. Farming is thus becoming more and more a small business with all the problems, managerial and environmental, of the small industrial company. The work environment is more hazardous, as the worker is generally untrained and unsupervised. Here again the problem is more one of environmental health rather than occupational health, for many of the hazardous aspects of farming affect not only the worker but the neighboring population and the consumer.

Engineering techniques are available and being applied at the source in large and small plants so that the industrial environment is as safe from physical and chemical hazards as the community. Technology with its emphasis on efficiency, including closed systems, reclamation of waste for processing as by-products, cleanliness and good housekeeping, has at the same time controlled many of the potential health hazards of industry. Fewer accidents occur in industry than in the community at large. The known occupational hazards, such as the heavy metals, silica dust and carbon monoxide, in the old and the new industries present no far-reaching consequences, as they can be handled by traditional methods which require only recognition and the application of well-known control principles and techniques.

It is true that in producing some of the newer materials for space crafts, missiles and atomic devices, the plant environment has been made more hazardous; for example, in the forging and rolling of metal alloys at 400° F under special gaseous atmospheres, working in radioactive-contaminated areas or testing ballistic missiles under water. While these special situations represent only relatively small fragments of our industry now, they presage things to come. These hazards will expand, but man has learned to control them by providing an entire immediate environment to the worker through the use of various protective clothing and devices, such as completely enclosed asbestos suits carrying their own oxygen supply system and containing air cooling units to combat external temperatures of 120° F and above.

The environment of man's work-place inevitably orients the standards of his total environment. In time both environments imperceptibly blend together. There is evidence that the plant environment at present may be less noxious than that of the community in which the worker lives. This thought is supported by data from the Metropolitan Life Insurance Company. According to the company's actuarial tables, a new peak of 70.5 years for the average expectancy of their industrial policy holders was reached in 1960. In 1909 the life expectancy for the life industrial policy holder was 6 years less than for the population as a whole, but this is now reversed and the industrial policy holders have a slight advantage. The accomplishments in increasing life expectancy were done chiefly through the reduction of communicable disease rates. At the same time, in-plant accidents and occupational disease rates were reduced. Based upon these findings one can surmise that occupational and non-occupational environments have almost entirely blended into one another and at this time the hazard to life within industry is not very different and is, if anything, slightly less dangerous than that of the community as a whole. But there is still a great deal to do in industry, and these generalizations are at best only indicators of direction rather than accomplishment.

To return to the question: "What is the role of occupational health in environmental health programs?" it appears to me that, with the background I have described, several basic functions can be assigned to it. Occupational health has a cadre of trained and experienced personnel, particularly for air-borne hazards and radiation protection. Many of the notable doctors and engineers working in the field of air pollution were recruited from the ranks of industrial hygiene. It was logical for these physicians and engineers to step from the control of the relatively limited, and often single air-borne contaminants of industry, to taking care of the same type of problem in the community. The same has been true for radiation protection. Conversely, air pollution experts and health physicists trained on the broader scale of the community are now beginning to be a potential source of recruitment for industry.

Occupational health is supplying some basis for the administrative skills necessary to handle the complex problems of community health. Industrial health management is in many ways unique and is one of

the major skills that must be blended with the experiences of the many governmental agencies concerned with public health, water supply, waste disposal, traffic control, air pollution, city management, agriculture and the like. In fact, the chief problem facing successful environmental health programs may well be the proper integration of the many overlapping governmental jurisdictions.

Occupational health experiences are providing operative and investigative techniques for environmental health programs, particularly in air hygiene and radiation protection. Conceivably we might arrive at a stage where we all may have to be fitted with special personal protective devices to survive. Man has developed a production and distribution system (clothing and shelter) for protection against cold. It is conceivable that we will develop a similar system to provide man with purified air that he may carry about with him. An air-conditioned car riding through desert heat is illustrative and undoubtedly a primitive example of what is to come. The technological development for the more advanced models is at present taking place within industry. The techniques for providing adequate and safe water are also well advanced and solutions will undoubtedly be found for the problems we are facing currently.

Occupational health can also provide the basis for educational opportunities and directions in environmental health programs. At present, persons in this field are prepared in one of two ways—either in a narrow, scientific discipline for the most part connected with schools of engineering, or more broadly educated through courses leading to M.P.H. or Dr. P.H. degrees which are given in the schools of public health. The training for a doctorate in public health really prepares men for becoming public health specialists, for administrative leadership in public health practice or for teaching and research in problems of organization, methods and programs. There is no real broadly based education program that prepares a man from a scientific discipline in the wide variety of environmental health problems. At the University of California, the School of Public Health and the College of Engineering are developing a course leading to a masters and doctorate degree in Environmental Health Sciences which overcomes these defects. Occupational health plays a specific role in these graduate degrees in providing an area of scientific depth as well as a background in the life sciences and public health.

This degree structure is an attempt to create a proper program of development for a student in a science department who may become interested in environmental health but has neither the desire nor the opportunity to attain the necessary experience by working in a health department. We are offering a single degree in environmental health sciences covering the specialties of industrial hygiene and air resources, radiological health, and environmental biology. The background of a candidate for these degrees would be a previous academic degree in fields as diverse as microbiology, chemistry and physics, or professional degrees in medicine or engineering. Individual programs will be related to the student's background and field of interest. In this way, competence in a wide variety of fields can be brought to bear upon problems of environmental health. There will be, of course, a common orientation to concepts underlying public health practice and knowledge of the two important tools, biostatistics and epidemiology, will be required. It is obvious that in establishing these educational opportunities, occupational health is one of the supporting structures, the others being sanitary engineering, the sanitary sciences and radiation protection.

Occupational health is a part of environmental health, but only a part of occupational health is so engaged. In spite of the merging of this aspect of occupational health into environmental health, there will always be a sub-specialty devoted to the well-being of workers since there will always be special administrative, environmental and medical problems existing within the confines of an industrial plant. The workers in the future will be valuable because of intensive, extensive and expensive training. Illness or injury, whether plant-connected or not, will cause economic loss. This may be compensated for to some extent by more emphasis on the machine and, therefore, there will be proportionately fewer and fewer workers. It will not, however, minimize the importance of the trained and educated man. But if present trends continue, a relatively few workers will do the work that will support the many young, old and unskilled who will make up the majority of the population. The practice of occupational health may also become the privilege of relatively few while the practice of environmental health may be the province of many.

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Allergen Purification by Discontinuity Gel Electrophoresis

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■ *Discontinuity gel electrophoresis can be used to prepare several allergens from purified grass pollen and house dust allergens. It is suggested as a general technique for the purification of allergens.*

IN THE PAST, methods of allergen purification have been adapted in many laboratories from the standard preparative methods of protein chemistry. However the purest protein or carbohydrate preparations resulting from application of these techniques have been demonstrated to be nonhomogenous.[7] For further purification of these allergens the disc electrophoresis technique of Davis and Ornstein[2] can be adapted to large scale preparations.

Materials and Methods

Preparation of Allergens

House dust and timothy pollen allergens were prepared as previously described.[4,7]

Orchard grass pollen was prepared by extracting the dried and defatted pollen (600 gm) with 3 liters of glucose-phosphate buffer[7] and the residue re-extracted with 500 ml of the same buffer. The extracts were combined, dialyzed against distilled water, made 0.15M with sodium chloride and adjusted to pH 10 with 0.15M sodium hydroxide. The preparation was clarified by centrifugation at 2500 rpm for 30 minutes. Ammonium sulfate (1,125 gm) was added to 3 liters of this solution and the resulting precipitate dissolved in and dialyzed against de-ionized water. As a result of dialysis a new precipitate formed. This precipitate was dissolved in 0.15M NaCl and adjusted to pH 10 with 0.15M NaOH. The final volume of solution was 102 ml and contained 2.5 gm of protein. The solution was brought up to 200 ml with 0.15M NaCl and 200 ml of ethanol at −15° C added. Following centrifugation at −10° C the supernatant was dialyzed against distilled water, lyophilized and dissolved in 0.15M NaCl to make a solution containing 0.9 per cent protein. The ethanol precipitate had considerable allergenic activity but less than the supernatant. Gel filtration was performed on 10 ml of the ethanol supernatant, using a column of Sephadex* G-75M (1.6 × 130 cm) and eluting with isotonic saline solution. Two peaks and a shoulder following the first peak were detected by spectrophotometry of the eluates at 280 millimicrons (Figure 1). The eluates in the tubes corresponding to each of the three fractions were pooled, dialyzed against de-ionized water, and lyophilized.

Preparation of Gels

Stock solutions were made up as follows:

	*A Electrophoresis Gel Solution**	*B Spacer Gel Solution†*
Acrylamide	286.00 gm	150.00 gm
N,N′-methylenebisacrylamide	1.87 gm	4.00 gm
12 N HCl	5.72 ml	10.00 ml
Tris-hydroxymethylaminomethane	51.90 gm	91.60 gm
N,N,N′,N′-tetraethylmethylenediamine	0.66 ml	1.15 ml
Potassium ferricyanide	40.00 mg	75.00 mg
Distilled water to make	1.00 liter	1.00 liter

*Cross-linked polydextran gel manufactured by Pharmacia Fine Chemicals, Inc., Upsala, Sweden.

†Polymerization initiator: 0.56 gm ammonium persulfate in 100 ml of water (Solution C).

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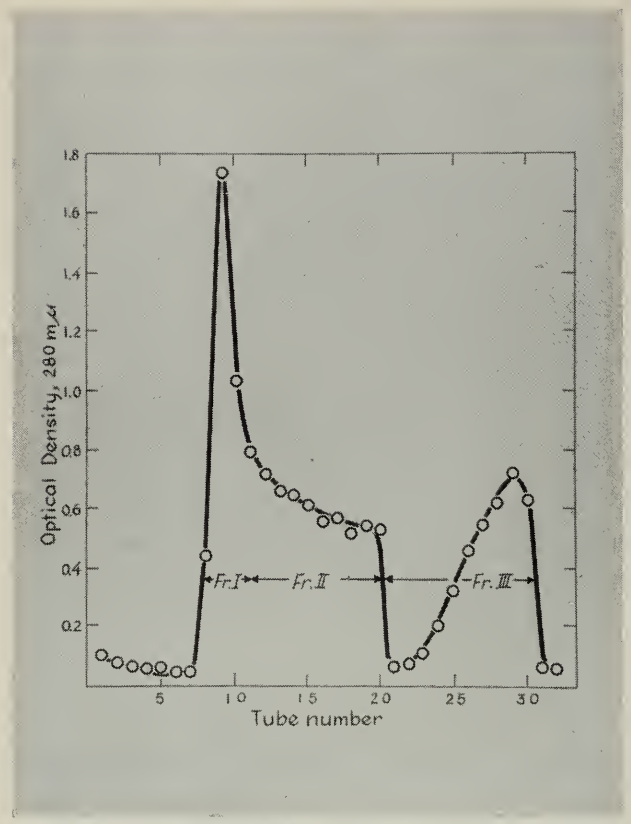


Figure 1.—Chromatography of ethanol soluble orchard grass allergen on Sephadex G-75M.

Electrophoresis (Figure 2)

A rubber sleeve about 2 inches long is fitted on the bottom of a glass tube 2.2 cm in diameter and 40 cm long so that 1½ inch of rubber tubing protrudes. A rubber stopper is inserted into the sleeve to within ½ inch of the end of the tube. This will result finally in a knob of gel hanging below the tube. Hard gel, containing 40 ml of solution A, 30 ml water and 10 ml of solution C is poured into the tube and allowed to harden. After the hard gel has set, the soft gel containing 6.7 ml of solution B, 10.8 ml of water and 2.5 ml of solution C is poured on top of the hard gel and allowed to harden.

The rubber sleeve and stopper are removed from the bottom of the tube. A rubber sleeve ½ inch long is then fitted over the top of the tube. This sleeve must make a tight seal with the hole in the bottom of the upper buffer vessel (fabricated from a plastic refrigerator jar (Figure 2)). The tube is immersed in a lower buffer vessel (a chromatography cylinder 14 cm × 45 cm) filled with undiluted Davis and Ornstein's buffer.[2] This immersion aids in cooling the gel. The upper buffer vessel is then filled with the same buffer, and the allergen solution, made dense by the addition of about 10 per cent glucose, is layered on top of the spacer gel, below the buffer (Figure 2). Platinum electrodes are inserted as shown. Current is maintained at 20 milliamperes per tube but no more than 400 volts should be employed. As electrophoresis proceeds, the allergen components form into thin discs and separate. Good separation can be obtained for samples as large as 100 mg protein.

After maximum separation has been attained, the gel is removed from the tube by pulling from the lower end. Each fraction is sliced out with a razor blade. Each slice is macerated with the help of a garlic press and the allergen is extracted by soaking the macerate in 0.15M NaCl.

Results

Typical patterns obtained by electrophoresis of house dust allergen and orchard grass allergen are shown in Figures 3 and 4. In Figure 3 the results of electrophoretic patterns of four different house dust allergen preparations run simultaneously are shown: (1) allergen prepared by the method of Berrens and Young[1] (B-Y); (2) house dust insoluble in 54.5 per cent ethanol at −15° C but soluble at 0° C; (3) and (4) cold ethanol soluble allergens prepared from the second and eighteenth extracts of the same batch of dust. Since the ethanol-soluble

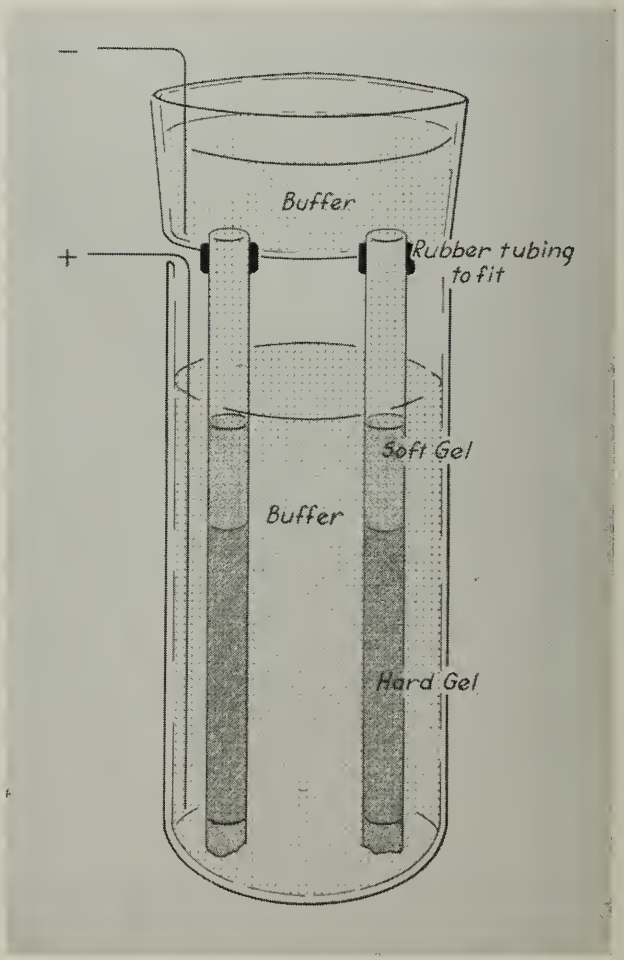


Figure 2.—Construction of electrophoresis cell.

allergens moved faster than the others, to obtain all patterns on the same scale for this figure the ethanol soluble allergens were run on a special hard gel containing 50 per cent additional monomer. When these allergens were run on the standard gel, the second disc split into five components. In Figure 4, the three fractions of orchard grass allergen obtained by Sephadex chromatography were each analyzed separately by electrophoresis. The dark band moving farthest toward the anode in each was colored blue by the bromphenol blue tracking dye present in the buffer. Anodic to it were several light yellow bands and above it one or two dark brown bands. In a similar fashion, ethanol-soluble timothy pollen allergen[7] produced six yellow bands on electrophoresis.

All the fractions of house dust allergen and all six fractions of timothy pollen allergen had allergenic activity. Quantitatively, different patients reacted differently to each fraction. However, no fraction was consistently most active or least active in all patients.[5] The orchard grass pollen allergens were tested by a passive transfer technique. Twenty-four hours before the test, serum from a patient with high sensitivity to grass pollens was injected intradermally (0.3 ml) into sites on the skin of a volunteer who does not give immediate skin reactions to grass allergen. Each colored disc from the orchard grass pollen allergen electrophoresis gels was extracted with 0.15M NaCl, dialyzed against distilled water, lyophilized and dissolved in 100 ml of 0.15M

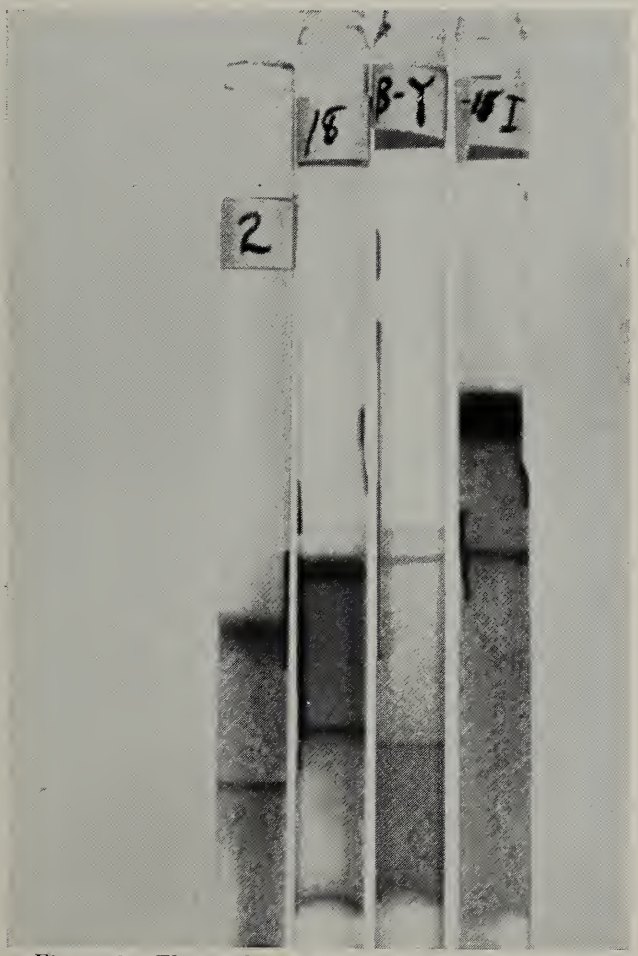


Figure 3.—Electropherograms of house dust allergens. Anode end on top. First and second tubes, using gels made from 50 per cent additional monomer, contain ethanol soluble allergen made from the second and eighteenth extracts of the same batch of crude dust. The third tube contains allergen prepared according to Berrens and Young,[1] the fourth house dust allergen soluble in ethanol but insoluble in cold ethanol.

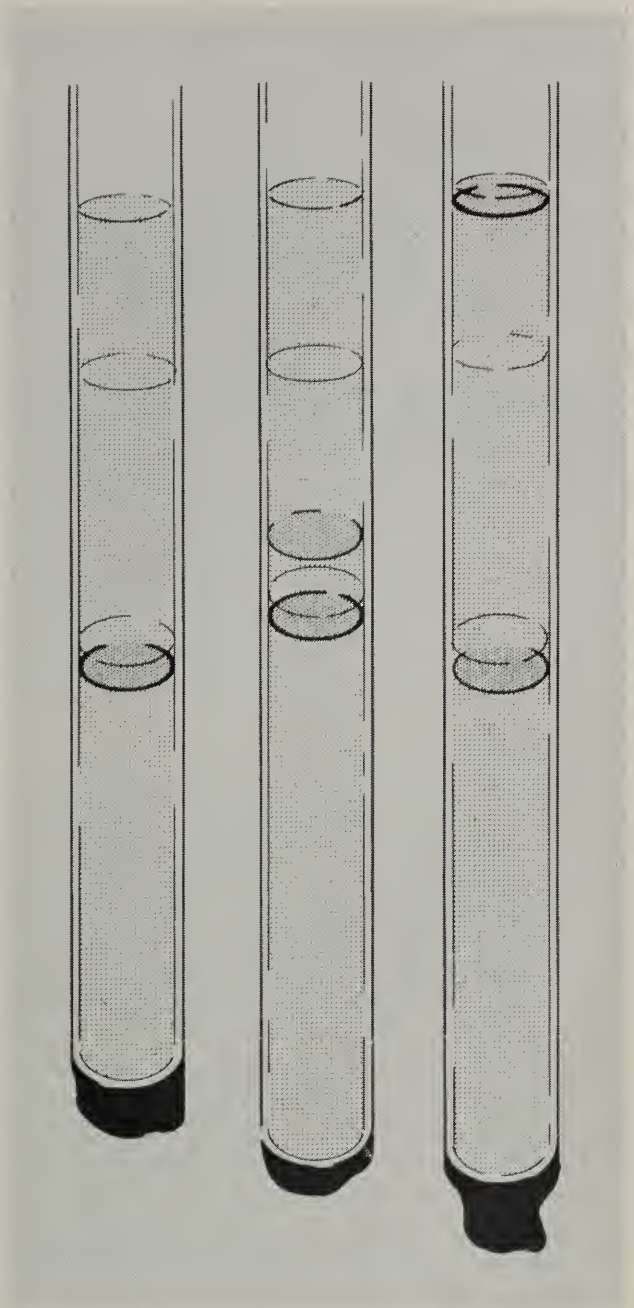


Figure 4.—Electropherograms of orchard grass allergens. Cathode end on top. The first, second and third tubes contain ethanol-soluble fractions III, II, and I respectively, from Sephadex G-75M. The first light line below the top at the same place in all three tubes represents the interface between the gels.

TABLE 1.—*Allergenic Activity of Orchard Grass Fractions Separated by Disc* Electrophoresis*

Fraction	*I-1*†	*I-2*	*II-1*	*II-2*	*III-1*	*I,II,III-3 (pooled)*
Reaction	+3	+	+2	+2	+2	+
Optical Density‡ (280 millimicrons)	0.081	0.012	0.094	0.104	0.012	0.084

*The discs are numbered from the cathode end of the cell downward.

†Roman numeral=Fraction from chromatography on Sephadex (see Figure 1). Arabic numeral=Band number.

‡An optical density of 0.100 corresponds to a concentration of ethanol-soluble orchard grass allergen of 70 micrograms per ml.

NaCl. One-fiftieth ml of each allergen solution was injected into both a sensitized site and a non-sensitized site in the volunteer's skin. No reactions were noted in the non-sensitized sites. The reactions found in the sensitized sites, as evaluated by standard criteria, are shown in Table 1. The material separated from the yellow bands anodic to the dye bands gave no reactions and are not recorded in the table. The material obtained from the blue bands of each gel, ascribed to dye, were pooled and only one test made.

Discussion

It is seen from these results that house dust allergen and two grass pollen allergens contain many different fractions, each of which is active in eliciting an immediate skin reaction. The most likely explanation for this finding is that for each type of allergen (timothy pollen, orchard grass pollen, house dust) all fractions are degradation products of some parent substance, which may or may not be itself an allergen.

Malley and coworkers[6] showed that timothy pollen contains an antigen which reacts only with sera from grass-sensitive patients. It is not an allergen and is the antigen responsible for the hemagglutination reaction described by Gordon and coworkers.[3] Since this antigen precipitates at a lower ammonium sulfate concentration than the allergen, it is probably of a higher molecular weight than the allergen. For this reason it has been suggested[4] that the hemagglutinating antigen is the parent form of the allergen and is degraded to it by enzymatic processes in the pollen. By this concept, a susceptible person who at first is not sensitive becomes immunized to the hemagglutinating antigen and then, upon subsequent exposure to the degradation product of the hemagglutinating antigen, responds by making an incomplete antibody, reagin.

The theory has been tested by injecting a house dust preparation which did not contain any detectable allergen but could be degraded to allergen[4] into patients sensitive to grass pollen but not sensitive to house dust.[4] As predicted, these patients acquired skin sensitivity to house dust.

The theory also explains why patients sensitive to foods will frequently not show any sensitivity to extracts of the foods by the intradermal skin test. The undigested food contains only the parent antigen, which is not degraded to allergen until it is acted upon by the digestive enzymes.

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REFERENCES

1. Berrens, L., and Young, E.: Purification and properties of house dust allergen, Int. Arch. Allergy, 19:341, 1961.

2. Davis, B. J., and Ornstein, L.: Disc electrophoresis, preprinted by Distillation Products Industries, Rochester, N.Y.

3. Gordon, J., Rose, B., and Sehon, A. H.: Detection of "non-precipitating" antibodies in sera of individuals allergic to ragweed by an *in vitro* method, J. Exp. Med., 108:37, 1958.

4. Lietze, A., and Reed, C. E.: Studies of house dust allergens: The separation of closely related allergens of different specificity and their relationship to allergenically inactive antigens, Int. Arch. Allergy, 20:344, 1962.

5. Lietze, A., and Reed, C. E.: To be published.

6. Malley, A., Lietze, A., and Reed, C. E.: The separation of substances in timothy pollen extract producing allergic skin reactions from those producing hemagglutination reactions, J. Allergy, 31:413, 1960.

7. Malley, A., Reed, C. E., and Lietze, A.: Isolation of allergens from timothy pollen, J. Allergy, 33:84, 1962.

A REVIEW

Recent Advances in the Treatment of Surgical Emergencies

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ADVANCES IN THE MANAGEMENT of surgical emergencies are dependent upon gains in our knowledge concerning the basic physiologic mechanisms of shock, hemorrhage and infection. The present review will attempt to correlate the progress made in these fields during 1963 with recent developments in clinical surgery.

Shock and Hemorrhage

Tremendous gains have been made in our understanding of the basic physiology of shock and hemorrhage. Although shock differs in experimental animals and humans, many common denominators have been found. The obvious limitations in a controlled study of human shock make it mandatory that we look carefully at the results of experimental studies in laboratory animals.

Hardaway[45] presented an exciting, unified concept of the pathophysiology of various types of shock states. According to him the essential factor in all types of shock is disseminated intravascular coagulation, a process which may be prevented by fibrinolysin. During reversible shock, intracapillary thrombi form but are dissolved by endogenous fibrinolysin whereas irreversibility is characterized by progressive disseminated intravascular coagulation. This fascinating concept needs further study in the human subject, especially since case reports of ischemic necrosis of several organs in prolonged human shock are beginning to appear in the literature.[41]

The importance of the microcirculation in shock is further emphasized by the work of Robb[84] who observed platelet microembolism in animals during several types of experimental shock. Norepinephrine accentuates the sludging effects of oligemic shock[91] but low-molecular-weight dextran is able to maintain the microcirculation and prevent tissue oxygen debt and death.[63] Bergentz and coworkers[12] have shown in humans that tissue injury is followed by a significant increase in the viscosity of whole blood. I believe that eventually norepinephrine and other vasopressor agents will no longer be used in the treatment of human shock although low-molecular-weight dextran may prove to have great value and should be investigated further.

Palmerio and coworkers,[80] on the basis of long-term studies in the laboratory of Jacob Fine, have proposed that the detoxifying properties of the reticuloendothelial system are damaged by ischemia during shock. They point out that the detoxification of endotoxin, whether absorbed from the intestine during hemorrhagic hypotension or derived from an established gram-negative infection, is thus seriously hampered. It is postulated that the unchallenged endotoxins damage the abdominal viscera, especially the intestine and liver, whose integrity is essential for normal reactivity of the peripheral vessels. These investigators further suggest that

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celiac blockade relieves vasoconstriction in the area where tissue damage threatens survival, that is, the splanchnic circulation, and should therefore be more effective than antiadrenergic agents whose site of activity is less selective. Vick and coworkers[116] demonstrated the beneficial effects of Dibenzyline® (phenoxybenzamine hydrochloride) in endotoxic shock. Certainly neither celiac blockade nor Dibenzyline is advocated until adequate restoration of blood volume and extracellular fluid has been accomplished. Simeone[96] pointed out that caution should be used in the extrapolation of animal experiments to human shock, especially when it is not associated with infection.

Hayasaka and coworkers[47] demonstrated the protective effects of aldosterone on endotoxin shock in cats. Although the mechanism of action of this agent is unclear, it is of interest that hydrocortisone has been used in large doses by Lillihei and his group in the treatment of endotoxic shock. The use of Tris buffer has been studied by two groups, but with differing results, and further investigation is required.[38,77] Wolfman and coworkers[123] confirmed the work of Shires and his group on the importance of isotonic saline solution in the treatment of hemorrhagic shock.

Two interesting studies were carried out on the effects of alcoholic intoxication on the response to acute hemorrhage in dogs.[37,57] The results of Knott and coworkers[57] indicated that alcoholic intoxication did not have an untoward effect upon the response to hemorrhagic stress. Gettler and Allbritten[37] showed that alcoholic intoxication was deleterious. However, the amount of blood they withdrew was considerably greater than that in the studies by Knott, an experimental difference which may explain the discrepancy in the results.

Lister and coworkers[65] in an impressive study of transcapillary refilling after hemorrhage in normal man, showed very clearly the deleterious effects of norepinephrine in human shock, because norepinephrine prevents normal hemodilution in the posthemorrhagic period. Angiotensin has been used in the treatment of human hypotensive states by Nassif and coworkers[76] who showed that this drug was effective when other pressors were not. The effect of angiotensin depends largely on arteriolar constriction in the renal and splanchnic bed. Because of the recently recognized damaging effects of splanchnic ischemia, angiotensin as well as norepinephrine may soon be contraindicated in the treatment of patients with shock.

The value of measuring central venous pressure in shock is becoming ever more apparent and the reader is referred to the work of Hallin,[43] and McGowan and Walters[71] for excellent reviews. This measurement will undoubtedly now be used with ever greater frequency as a monitor for the administration of blood and other fluids in shock.

Cardiac Arrest, Pulmonary Embolism

The problem of closed cardiac resuscitation continues to be investigated.[120] Yanoff[124] showed that free-fat pulmonary emboli are common in patients undergoing closed-chest resuscitation, but the significance of these findings is not as yet readily apparent. The excellent study of Boyan and Howland[16] indicated that the incidence of cardiac arrest in patients receiving massive transfusions during radical operation for carcinoma is significantly decreased when cold blood is warmed before administration. This observation certainly bears clinical application. It should also be pointed out that the ACD solution used for the storage of bank blood has a severe acidifying effect on the donor's blood and that during storage further reduction in the pH occurs with the accumulation of lactic acid.[88] Altemeier and Todd[4] have pointed out the unexpectedly low incidence of 4.655 per cent of postoperative wound infection after open cardiac resuscitation and emphasize the need for more basic exploration into the reasons for this low rate of infection under less than ideal conditions. Thaler and Stobie[109] have made a significant contribution to reducing the complications of hepatic injury in children undergoing external cardiac compression. The technique they suggest for infants and young children consists of compressing the *midsternum* with superimposed thumbs while the fingers are linked behind the patient for additional support.

Pulmonary embolectomy is slowly beginning to play an important role in the treatment of thromboembolism. Donaldson and coworkers,[28] in a retrospective study, found that approximately one-fifth of the patients dying from pulmonary embolism survive long enough to permit operative treatment with the aid of a pump oxygenator. It is generally agreed that a planned operative procedure with cardiopulmonary by-pass is preferable to the traditional Trendelenburg operation.[7,25,28,106] Most reports recommend either ligation or plication of the inferior vena cava after removal of the emboli.[7,90,106] Venous angiography may be of great aid in the diagnosis of this condition.[106,121]

Esophagus, Stomach and Duodenum

Britton and Crile[18] have reported a follow-up study of their experience with transesophageal ligation of bleeding esophageal varices. Bleeding recurred in four of fourteen patients with extrahepatic block and in four of eight of the survivors with cirrhosis of the liver. They concluded that transesophageal ligation was most effective in con-

trolling hemorrhage from varices limited to the distal third of the esophagus. I believe that the results reported by Britton and Crile do not lend much support to this method of therapy. Orloff and Thomas[79] studied the cardioesophageal area grossly and microscopically in 20 unselected patients with variceal hemorrhage during the course of transesophageal varix ligations. They were able to find evidence of esophagitis in only one of the 20 patients, which confirms the thesis of Leibowitz that factors other than esophagitis are important in the pathogenesis of ruptured esophageal varices. Studies on rupture of the esophagus are continuing and indicate that early therapy with wide drainage and maintenance of adequate nutrition during the prolonged convalescence is of extreme importance.[115]

Strahan[107] described an interesting and potentially valuable method of repairing a previously established esophageal fistula with Eastman 910 adhesive, but further studies are necessary before it can be applied to humans. Hays and Snyder[48] indicated that in premature infants with tracheoesophageal fistula, rupture of the anastomosis is associated with a far lower mortality rate when an extrapleural approach is used.

Caustic burns of the esophagus continue to be an exceedingly difficult problem. Cleveland and coworkers[23] showed that in children with lye burns of the esophagus, esophagoscopy performed soon after the lye has been swallowed is safe and even essential to diagnosis and management.

Jordan, DeBakey and Cooley[56] reviewed their experiences with resection in the management of acute gastroduodenal perforation and reported an over-all mortality rate of 2 per cent. A degree of selectivity was present in this series, however, because of such contraindications to operation as generalized purulent peritonitis, localized abscesses around the duodenum, shock and associated systemic diseases. Royster and associates[86] pointed out that a definitive operation should be performed more frequently for acute perforated peptic ulcer. In a follow-up study of 86 cases of simple closure, 30 per cent of the patients required a secondary definitive operation, 31 per cent were symptomatic and only 27 per cent were asymptomatic. No follow-up studies were possible in 12 per cent of the patients. No deaths occurred in a group of patients reported by Harvey[46] who were especially selected for resection during acute perforation. Howard and Singh[52] found that in 58 of 59 patients with perforated peptic ulcer the peritoneal fluid had an alkaline pH. This fact is of great importance when analysis of paracentesis fluid is being made in patients with acute abdominal catastrophes and is certainly in contrast to general opinion. Instillation of 300 to 500 ml of air into the stomach may be of value in the diagnosis of perforated gastroduodenal ulcers but a larger series than the 24 cases reported by Henelt and coworkers[49] is necessary before this measure is put to general use.

Kozoll and Meyer reviewed the histories of 2,008 patients with massively bleeding gastroduodenal ulcers seen at the Cook County Hospital.[58-60] Radiologic studies taken after the bleeding had stopped revealed the bleeding site in more than 75 per cent of the cases. The mortality rate for duodenal ulcer was 13.8 per cent, and for gastric ulcer, 30.8 per cent. The mortality rate steadily increased as the age of the patients rose. Starzl and Sanders[104] described a useful maneuver to detect the site of gastric hemorrhage; the gastrocolic omentum is divided and the stomach is inverted along the greater curvature with a sponge forceps to allow visualization of the entire inner aspect of the stomach.

Foster, Hickok and Dunphy,[33] in a provocative study of 178 cases of massive upper gastrointestinal hemorrhage, showed the importance of advancing age and concomitant diseases in increasing the mortality rates. The use of pyloroplasty and vagotomy for the emergency control of massive upper gastrointestinal hemorrhage, especially in patients whose massive hemorrhage began during hospitalization for other conditions, has been forced upon the authors by the unacceptably high mortality rate following emergency gastric resection. No mortalities occurred in seven patients undergoing pyloroplasty and vagotomy. Expansion of this series to larger numbers of cases is indicated and necessary. In contradistinction, Akin and Sullivan[1] indicated a very high incidence of complications, especially postoperative recurrent bleeding, in a series of 20 cases of pyloroplasty and vagotomy for emergency hemorrhage, and they cautioned against use of the procedure. In my estimation, some of these differences of opinion can be resolved by more careful attention to and description of the type of ulceration being treated by pyloroplasty and vagotomy. The deleterious effect of associated conditions in the patient with massive gastrointestinal hemorrhage is further emphasized by the report of Cammock and coworkers.[21] It is generally agreed that gastric cooling (not freezing) is useful in the management of massive upper gastrointestinal hemorrhage.[73,114,118] Although gastric hypothermia is not completely successful in all types of hemorrhage, good results can be achieved in esophageal varices and duodenal, gastric, and marginal ulcers. Less satisfactory responses are seen in postoperative hemorrhage and hemorrhage from stress or steroid-induced ulcers.

The complications of gastric resection received continuing study. Blomquist[14] very clearly described the mechanism of obstruction of the afferent loop following gastric resection. Many reports have appeared recently concerning the development of phytobezoars in patients who have had gastrectomy.[69] Citrus fruits, especially orange pulp, have been implicated as a very important cause of bowel obstruction in such patients. Thompson[111] reported four cases of ischemic necrosis of the proximal gastric remnant following subtotal gastrectomy; he concluded that subtotal gastrectomy, with ligation of the left gastric artery at its origin, splenectomy and removal of the short gastric arteries, is a procedure of great risk. The usual area of necrosis occurs along the greater curvature of the stomach and the mortality rate is exceedingly high.

The mechanism of so-called spontaneous rupture of the stomach has been reviewed thoroughly by two groups of investigators[2,26] and the recognition of such an entity by surgeons is becoming increasingly evident. Jones and Joergenson[55] advocated the use of a Roux-en-Y patch type of anastomosis of jejunum to the side of the duodenum to cover large duodenal defects. This interesting and important technique may see much further use, particularly in the extremely difficult treatment of the lateral duodenal fistula.

Liver, Biliary Tract and Pancreas

The extremely high mortality rate of hepatic injuries[92] has led to careful studies of the management of hepatic trauma. Two relatively new principles have been introduced that may improve the results of therapy in this devastating condition. Merendino and coworkers[72] proposed drainage of the common bile duct in the management of trauma to the liver, believing that it may decrease the incidence of subphrenic abscess and accumulation of bile after massive hepatic trauma. Poulos[82] suggested the value of resection of massively damaged segments of liver and expressed belief that this will become an important method of debridement of the liver when huge segments of it are irreparably damaged. The increased number of reports of traumatic hemobilia is testimony to the fact that hepatic trauma and its sequelae need further careful study. This severe complication of hepatic trauma may be diagnosed by preoperative hepatic arteriography or a radioactive rose bengal scan.[40] Spencer and coworkers[102] reported the value of operative cholangiography in demonstrating the site of the cavity within the liver. Various methods of therapy have been utilized,[5] including ligation of the right hepatic artery[101] and hepatic lobectomy.[102]

Santschi and associates[89] reported four cases of generalized bile peritonitis in adults in which the complaint was abdominal distention with virtually no abdominal pain, tenderness, fever or leukocytosis. Their article is an extremely important one; I have observed several cases in which the clinician has been lulled into a false sense of security by the lack of findings in the abdomen. Thoren[112] has done some very nice experimental work on the basic injurious mechanisms in bile peritonitis. He demonstrated that the surface-active bile salts are probably bound to protein in peritoneal exudate before reabsorption, and therefore do not cause hemolysis when they are absorbed. However, if bile peritonitis is complicated by hemorrhage, hemolysis does occur and resulting renal damage is much greater.

Albo and coworkers[3] expressed doubts about the value of the serum amylase determination in the diagnosis of acute pancreatitis. Gambill and Mason[35] also experienced disappointments with this test and found that the urinary amylase determination has a far greater accuracy in the presence of acute pancreatitis.

Saidi and Donaldson[87] reported 24 cases of pancreatitis occurring after 3,018 subtotal distal gastrectomies for duodenal ulcer. The serum amylase again was of remarkably little value in the diagnosis although fever, tachycardia and leukocytosis were always present, a finding also noted by Albo.[3] An antiproteolytic substance called Trasylol has been found to improve the mortality rate uniformly in experimental pancreatitis of various types.[70,78,98] Whether or not this material has value in clinical acute pancreatitis remains to be determined. The same is true for propylthiouracil, which also has been shown to be of value in experimental hemorrhagic pancreatitis.[110] Shinowara and coworkers[94] demonstrated a consistent, pronounced elevation of the thromboplastic plasma component (factor VIII) as well as hyperfibrinogenemia in acute pancreatitis. They suggested that these changes in the blood set the stage for hypercoagulability, a concept which would fit well with Hardaway's suggestion that disseminated intravascular coagulation may be present in acute pancreatitis. Thal and his coworkers[108] found many smooth muscle-stimulating substances in the blood in both experimental and clinical pancreatitis. They expressed belief that these substances most probably represent bradykinin or kallidin. These materials produce extreme vasodilatation and increased permeability when injected into a vascular bed. Trasylol reduces the concentration of these substances in the peripheral blood in both human and experimental pancreatitis.

As in hepatic trauma, a more aggressive approach has been taken toward the treatment of injury to the pancreas. Baker and coworkers[6] advocated wide exposure of the pancreas through the gastrocolic omentum, debridement of damaged tissue and iden-

tification of the ductal system. Doubilet and Mulholland[29] advised sphincterotomy and intubation of the pancreatic duct after severe pancreatic trauma. This principle will probably become more widely accepted in future years.

Abdominal Cavity, Small and Large Intestine

Handelsman and associates[44] recently stressed the value of a one-layer end-to-end anastomosis with non-absorbable suture material and evacuation of the dilated intestine in the treatment of congenital jejuno-ileal atresia. This method of therapy is apparently coming into wider use, together with resection of the dilated proximal atonic portion of the intestine, although Richardson[83] has emphasized the role that enterostomy plays in intestinal obstruction. Perhaps the greatest value of enterostomy lies in the treatment of meconium ileus. An interesting variant of meconium ileus which Cordonnier and Izant[24] have called *meconium ileus equivalent*, should be kept in mind when treating older children. This diagnosis is suggested when mechanical intestinal obstruction occurs in a child with known or suspected cystic fibrosis. This entity has been observed in children who have not followed pancreatic substitution therapy faithfully. The Duhamel operation, which is receiving increasing attention in the treatment of Hirschsprung's disease, has recently been utilized successfully in the emergency neonatal treatment of complete aganglionosis of the colon.[27]

Mason and coworkers[68] reported the interesting finding of indirect hyperbilirubinemia in infants with malrotation and duodenal bands. This finding has also been described in hypertrophic pyloric stenosis and although the cause is unknown, it would appear that a decreased production of glucuronyl transferase may be related to lack of available glucose caused by starvation. An important type of functional intestinal obstruction in newborn infants was mentioned by Sieber and Girdany.[93] They described seven infants, five of whom were premature and all of whom had evidence of intestinal obstruction without demonstrable anatomic abnormalities. The clinical course closely resembled that seen in infants with neonatal aganglionosis. The cause for this clinical syndrome is not known. Waldhausen and his coworkers[117] described six cases of fulminating necrotizing colitis occurring in infancy which progressed rapidly to perforation of the colon and peritonitis. Infection, especially with pseudomonas, appeared to be the most common etiologic agent. The problem of intussusception has been reviewed by several investigators.[11,61,81] Of particular interest is the fact pointed out by Kyle and coworkers[61] that recurrent intussusception following definitive therapy is not nearly so rare as previously thought.

The diagnosis of strangulation obstruction of the small intestine remains a problem. Determinations of serum lactic dehydrogenase activity have not been particularly helpful.[62] Byrne and Boyd[20] showed that the hyperamylasemia of intestinal obstruction may be diminished experimentally by total gastrectomy or by treatment with propantheline bromide (Pro-Banthine®). They suggest that extreme pressure within the duodenum may cause obstruction of the sphincter of Oddi with consequent retrograde flow of pancreatic secretion through venous channels.

Gallstone ileus has been studied by Buetow and Crompton,[19] who found that since 1925 the mortality rate has decreased from 75 per cent to 13.6 per cent. Two separate reports have been made of barium enema reduction of gallstone obturation, an interesting but probably not a frequently applicable method of dealing with this problem.[74,119] Rothwell-Jackson[85] described three cases of idiopathic obstruction of the large bowel. This is actually the same entity previously noted by Morton, Schwartz and Gramiak, and is probably better referred to as colonic ileus. It may be associated with a variety of other diseases or may arise *de novo*. The important conclusion reached by Rothwell-Jackson is that operative decompression is occasionally necessary to avoid cecal perforation in the absence of organic obstruction.

A more aggressive attitude is being taken toward treatment of embolic and thrombolic occlusion of the superior mesenteric artery, whether by embolism or thrombosis. Successful treatment of both types has been described.[8,17] Certainly the mortality rate of 92.4 per cent reported by Solheim[100] justifies an aggressive approach to this problem. Marston[66,67] has demonstrated an extremely high rate of loss of plasma following experimental occlusion of the superior mesenteric artery. The importance of massive transfusions of plasma is emphasized. Boley and coworkers[15] reported five cases of vascular occlusion of the colon characterized by abdominal pain and rectal bleeding but few other clinical symptoms or signs. The authors emphasized that the progress of vascular occlusion of the colon cannot be predicted from initial roentgenographic studies, and if symptoms persist surgical intervention is indicated. Hickey and associates[51] advocate a double-barreled ileostomy for the treatment of fulminating ulcerative colitis with colonic wall necrosis. Li[64] reviewed his interesting experiences with 20 cases of perforation of typhoid ulceration of the intestine occurring in Hong Kong. Eighteen of the 20 patients recovered after simple closure of the perforation,

thorough evacuation of the peritoneal exudate and administration of chloramphenicol.

Biggs and coworkers[13] reported on 279 consecutive civilian patients with injuries of the colon. Primary repair without colostomy was performed 220 times with a mortality rate of 5.5 per cent, as opposed to a mortality rate of 33 per cent in 52 cases in which a two-stage procedure was used. Primary repair is being used more frequently and the Biggs group said they considered it the method of choice. It should be pointed out, however, that it is possible there was some degree of selectivity which could have led to the large difference in mortality rate in the two types of therapy. Williams and Sargent[122] in experimental studies on dogs showed that a shearing action between two opposing surfaces, rather than a bursting effect, is the primary cause of intestinal injury due to blunt abdominal trauma.

Cardiovascular System

As the techniques of vascular operations have progressively improved, interest in the management of vascular injuries has increased.[10,50,97,99,103,105] Prompt recognition of the vascular injury is of the utmost importance to early repair. Beall and coworkers[10] advocated immediate repair of traumatic arteriovenous fistulae rather than waiting the traditional long period for collateral circulation to develop. The same is true in the case of arteriovenous fistula resulting from lumbar-disc operations, as was pointed out by Spittell and associates.[103] These investigators also discussed the methods of prevention of this very serious complication of disc operations. It is generally agreed that if an autogenous artery cannot be utilized for repair of arterial injuries, autogenous vein grafts probably provide the best tissue for arterial substitution because of their ready availability, resistance to infection and greater flexibility at joints.[50] Extensive operative exposure may be required to provide adequate vascular control in injuries of the subclavian or axillary vessels.[97,105] Splitting the sternum, clavicular resection and an incision into the third interspace may all be necessary to obtain a satisfactory operative exposure. Nabseth and Jones[75] reported loss of portions of the lower extremities after femoral venipuncture in seriously ill and dehydrated infants. Apparently gangrene of the lower extremities resulted from injury and consequent thrombosis of the femoral arteries. The authors suggested that the femoral vein not be utilized for withdrawal of blood in seriously ill infants.

Peripheral arterial embolism is discussed in detail by Young and his associates.[125] Perhaps the most significant contribution to the treatment of peripheral arterial embolization was made by Fogarty and coworkers[32] who advocated the use of a remarkably simple yet effective principle. Their method is based on introducing long slender catheters into the arterial system; then a very soft balloon is inflated at the tip, after which the catheter and large portions of clot are withdrawn by the balloon as gentle traction is applied to the catheter. I have used these instruments with great success, especially in late cases.

Intestinal complications of aortic disease or of aortic operations have become increasingly common. Garrett and coworkers[36] reported the occurrence of 15 aortoduodenal fistulae in 3,000 patients who underwent abdominal aortic resections. In two of these patients the fistula was primary and in the remainder it occurred after aortic operation. The most common preoperative diagnosis was bleeding duodenal ulcer. The usual site of aortic fistulization is the duodenum; the jejunum and ileum are involved less frequently, according to Humphries and coworkers.[54] These two groups as well as Tolstedt[113] described methods of prevention of aortoduodenal fistula following aortic resection. The great importance of reperitonealization over the aortic homograft and possibly the interposition of omentum in this area was stressed. Thrombosis of the inferior mesenteric artery may occur spontaneously and cause infarction of the colon, or the thrombosis of the artery may be secondary to thrombus within an aortic aneurysm. More common than either of these mechanisms is the ligation of the inferior mesenteric artery during aortic resection in the presence of occlusive disease of the hypogastric vessels. Young and coworkers[126] described this complication and its clinical manifestations very well. Whenever it is known preoperatively that patients scheduled for aortic resection have severe occlusive disease of the hypogastric artery, intestinal antibiotics may be of some value. Ligation of the inferior mesenteric artery very close to the aorta to allow possible collateral flow through the left colic artery and its collateralization with the superior mesenteric vessels through the middle colic artery may be of great importance. In these circumstances the color and peristalsis of the colon must be observed very carefully.

The ever-increasing problem of sepsis as a complication of arterial reconstructive operations is discussed by Carter and coworkers[22] and Shaw and Baue.[93] Carter and coworkers were able to effect healing in seven cases of infected synthetic prostheses. Shaw and Baue said that such a result almost never occurred in their patients, and that has been my experience. The infection does not subside until the graft is removed. The explanation for the disparity in results between these two groups is not readily apparent.

Beall and coworkers[10] described the emergency nature of perforation of arteriosclerotic aneurysms into the inferior vena cava. The patient usually is first seen with signs of fulminating progressive congestive cardiac failure and cardiac embarrassment. Delaying treatment in attempts to improve the patient's preoperative condition is ill advised since only early operation will reverse the congestive heart failure. Fry and associates[34] showed in dogs that the hypotension which occurs after release of infrarenal aortic occlusion is due to reactive hyperemia and intravascular sequestration of significant portions of the total circulating blood volume into the lower extremities. They were able to prevent this problem with the use of regional vasopressor drugs; and they then applied this technique successfully in 15 clinical patients. Engler and coworkers[30] were able to prevent such hypotension by using a small arterial shunt around the aortic occlusion.

Hume and Porter[53] made a very strong case for early operation in patients with dissecting aneurysm of the aorta. Their position is based on studies that indicated an improved rate of survival following surgical therapy and the finding that the natural recovery rate from dissecting aneurysm is not nearly as high as the 20 to 25 per cent which has previously been reported.

Golding and associates[39] provided very strong evidence that sympathectomy produces earlier cessation of pain, diminution of edema, earlier and more distal demarcation, more rapid epithelization and an increased rate of healing in patients with frostbite. The results of this carefully done study should be heeded.

Haller and Abrams[42] and Fogerty and coworkers[32] showed very clearly the value of iliofemoral thrombectomy in the treatment of iliofemoral venous thrombosis. The rationale of this therapy is sound, in that it is intended to prevent destruction of the deep venous valves and consequent delayed post-phlebitic sequelae. The mortality and complication rates are low. The results are extremely encouraging, especially when the procedure is carried out within the first few days after thrombosis.

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REFERENCES

1. Akin, J. M., and Sullivan, M. B.: Pyloroplasty and vagotomy: Compromise procedure for control of acute peptic ulcer hemorrhage, Surgery, 54:587, 1963.

2. Albo, R., de Lorimier, A. A., and Silen, W.: Spontaneous rupture of the stomach in the adult, Surgery, 53:797, 1963.

3. Albo, R., Silen, W., and Goldman, L.: A critical clinical analysis of acute pancreatitis, Arch. Surg., 86:1032, 1963.

4. Altemeier, W. A., and Todd, J.: Studies on the incidence of infection following open chest cardiac massage for cardiac arrest, Ann. Surg., 158: 596, 1963.

5. Amerson, J. R., and Ferguson, I. A.: Traumatic hemobilia, Surgery, 54:729, 1963.

6. Baker, R. J., Dippel, W. F., Freeark, R. J., and Strohl, E. L.: The surgical significance of trauma to the pancreas, Arch. Surg., 86:1038, 1963.

7. Baker, R. R.: Pulmonary embolism, Surgery, 54:687, 1963.

8. Baue, A. E., and Austen, W. G.: Superior mesenteric artery embolism, Surg., Gynec. & Obstet., 116:474, 1963.

9. Beall, A. C., Jr., Cooley, D. A., Morris, G. C., Jr., and DeBakey, M. E.: Perforation of arteriosclerotic aneurysms into inferior vena cava, Arch. Surg., 86:809, 1963.

10. Beall, A. C., Jr., Harrington, O. B., Crawford, E. S., and DeBakey, M. E.: Surgical management of traumatic arteriovenous aneurysms, Am. J. Surg., 106:610, 1963.

11. Benson, C. D., Lloyd, J. R., and Fischer, H.: Intussusception in infants and children, Arch. Surg., 86:745, 1963.

12. Bergentz, S. E., Gelin, L. E., Rudenstam, C. M., and Zederfeldt, B.: The viscosity of whole blood in trauma, Acta Chir. Scand., 126:289, 1963.

13. Biggs, T. M., Beall, A. C., Jr., Gordon, W. B., Morris, G. C., Jr., and DeBakey, M. E.: Surgical management of civilian colon injuries, J. Trauma, 3:484, 1963.

14. Blomquist, H. E.: Acute obstruction of afferent loop following gastric resection A. M. Billroth II-Hofmeister, Acta Chir. Scand., 126:92, 1963.

15. Boley, S. J., Schwartz, S.. Lash, J., and Sternhill, V.: Reversible vascular occlusion of the colon, Surg., Gynec. & Obstet., 116:53, 1963.

16. Boyan, C. P., and Howland, W. S.: Cardiac arrest and temperature of bank blood, J.A.M.A., 183:58, 1963.

17. Brittain, R. S., and Earley, T. K.: Emergency thromboendarterectomy of the superior mesenteric artery: Report of four cases, Ann. Surg., 158:138, 1963.

18. Britton, R. C., and Crile, G., Jr.: Late results of transesophageal suture of bleeding esophageal varices, Surg. Gynec. & Obstet., 117:10, 1963.

19. Buetow, G. W., and Crampton, R. S.: Gallstone ileus. A report of 23 cases, Arch. Surg., 86: 504, 1963.

20. Byrne, J. J., and Boyd, T. F.: Hyperamylasemia in intestinal obstruction and its relationship to pancreatitis, Am. J. Surg., 105:720, 1963.

21. Cammock, E. E., Hallett, W. Y., Nyhus, L. M., and Harkins, H. N.: Diagnosis and therapy in gastrointestinal hemorrhage. A study of 410 patients, Arch. Surg., 86:608, 1963.

22. Carter, S. C., Cohen, A., and Whelan, T. J.: Clinical experience with management of the infected dacron graft, Ann. Surg., 158:249, 1963.

23. Cleveland, W. W., Chandler, J. R., and Lawson, R. B.: Treatment of caustic burns of the esophagus. Early esophagoscopy and adrenocortical steroids, J.A.M.A., 186:262, 1963.

24. Cordonnier, J. K., and Izant, R. J.: Meconium ileus equivalent, Surgery, 54:667, 1963.

25. Cross, F. S., and Mowlem, A.: Pulmonary embolectomy utilizing cardiopulmonary bypass, Surg., Gynec. & Obstet., 117:71, 1963.

26. Davis, C., Jr., Andresen, R., Akre, O., and McCarthy, W.: Spontaneous rupture of the stomach, Arch. Surg., 86:170, 1963.

27. Desjardins, J. G., and Simpson, J. S.: Neonatal Hirschsprung's disease. Treatment of complete aganglionosis of the colon by the Duhamel operation, Arch. Surg., 87:1019, 1963.

28. Donaldson, G. A., Williams, C., Schnnel, J. G., and Shaw, R. S.: A reappraisal of the application of the Trendelenburg operation to massive fatal embolism. Report of a successful pulmonary-artery thrombectomy using a cardiopulmonary bypass, New Engl. J. Med., 268:171, 1963.

29. Doubilet, H., and Mulholland, J. H.: Some observations on the treatment of trauma to the pancreas, Am. J. Surg., 105:741, 1963.

30. Engler, H. S., Ellison, L. T., Moretz, W. H., Simpson, J. G., Gleaton, H. E., and Freeman, R. A.: Shock following release of aortic cross-clamping. Its prevention by shunt, Arch. Surg., 86:791, 1963.

31. Fogarty, T. J., Cranley, J. J., Krause, R. J., Strasser, E. S., and Hafner, C. D.: Surgical management of phlegmasia cerulea dolens, Arch. Surg., 86:256, 1963.

32. Fogarty, T. J., Cranley, J. J., Krause, R. J., Strasser, E. S., and Hafner, C. D.: A method for extraction of arterial emboli and thrombi, Surg., Gynec. & Obstet., 116:241, 1963.

33. Foster, J. H., Hickok, D. F., and Dunphy, J. E.: Factors influencing mortality following emergency operation for massive upper gastrointestinal hemorrhage, Surg., Gynec. & Obstet., 117:257, 1963.

34. Fry, W. J., Keitzer, W. F., Kraft, R. O., and DeWeese, M. S.: Prevention of hypotension due to aortic release, Surg., Gynec. & Obstet., 116:301, 1963.

35. Gambill, E. E., and Mason, H. L.: One-hour value for urinary amylase in 96 patients with pancreatitis, J.A.M.A., 186:24, 1963.

36. Garrett, H. E., Beall, A. C., Jr., Jordan, G. L., Jr., and DeBakey, M. E.: Surgical considerations of massive gastrointestinal tract hemorrhage caused by aortoduodenal fistula, Am. J. Surg., 105:6, 1963.

37. Gettler, D. T., and Allbritten, F. F., Jr.: Effect of alcohol intoxication on the respiratory exchange and mortality rate associated with acute hemorrhage in anesthetized dogs, Ann. Surg., 158:151, 1963.

38. Goetz, R. H., Selmonosky, C. A., and State, D.: The effect of the amine buffer Tris (hydroxymethyl) amino methane (Tham) on the renal blood flow during hemorrhagic shock, Surg., Gynec. & Obstet., 117:715, 1963.

39. Golding, M. R., Dejong, P., Sawyer, P. N., Hennigar, G. R., and Wesolowski, S. A.: Protection from early and late sequelae of frostbite by regional sympathectomy: mechanism of "cold sensitivity" following frostbite, Surgery, 53:303, 1963.

40. Graff, R. J.: Considerations in the treatment of traumatic hemobilia, Am. J. Surg., 105:662, 1963.

41. Haber M. H., Brown, W. T., and Schneider, K. A.: Ischemic necrosis of multiple organs in prolonged shock, J.A.M.A., 183:1107, 1963.

42. Haller, J. A., Jr., and Abrams, B. L.: Use of thrombectomy in the treatment of acute iliofemoral venous thrombosis in forty-five patients, Ann. Surg., 159:561, 1963.

43. Hallin, R. W.: Continous venous pressure monitoring as a guide to fluid administration in the hypotensive patient, Am. J. Surg., 106:164, 1963.

44. Handelsman, J. C., Abrams, S., and Corry, R. J.: Improvement of therapy for congenital jejunoileal atresia, Surg., Gynec. & Obstet., 117:691, 1963.

45. Hardaway, R. M., and McKay, D. G.: The syndromes of disseminated intravascular coagulation, Rev. Surg., 20:297, 1963.

46. Harvey, H. D.: Emergency gastric resection for bleeding and perforation, Arch. Surg., 86:557, 1963.

47. Hayasaka, H., and Howard, J. M.: Mechanism of action of D-Aldosterone in endotoxin shock, Surgery, 54:761, 1963.

48. Hays, D. M., and Snyder, W. H., Jr.: Results of conventional operative procedures for esophageal atresia in premature infants, Am. J. Surg., 106:19, 1963.

49. Henelt, E. R., Smith, S. E., and Dodds, M. E.: Pneumogastrography in perforated gastroduodenal ulcers, Am. J. Surg., 106:491, 1963.

50. Hershey, F. B., and Spencer, A. D.: Autogenous vein grafts for repair of arterial injuries, Arch. Surg., 86:836, 1963.

51. Hickey, R. C., Tidrick, R. T., and Layton, J. M.: Fulminating ulcerative colitis with colonic wall necrosis, Arch. Surg., 86:764, 1963.

52. Howard, J. M., and Singh, L. M.: Peritoneal fluid pH after perforation of peptic ulcers. The myth of "acid-peritonitis," Arch. Surg., 87:483, 1963.

53. Hume, D. M., and Porter, R. R.: Acute dissecting aortic aneurysms, Surgery, 53:122, 1963.

54. Humphries, A. W., Young, J. R., DeWolfe, V. G., and LeFevre, F. A.: Complications of abdominal aortic surgery. I. Aortoenteric fistula, Arch. Surg., 86:43, 1963.

55. Jones, S. A., and Joergenson, E. J.: Closure of duodenal wall defects, Surgery, 53:438, 1963.

56. Jordan, G. L., Jr., DeBakey, M. E., and Cooley, D. A.: The role of resective therapy in the management of acute gastroduodenal perforation, Am. J. Surg., 105:396, 1963.

57. Knott, D. H., Barlow, G., and Beard, J. D.: Effects of alcohol ingestion on the production of and response to experimental hemorrhagic stress, New Engl. J. Med., 269, 1963.

58. Kozoll, D. D., and Meyer, K. A.: Laboratory findings in massively bleeding gastroduodenal ulcers, Arch. Surg., 87: 916, 1963.

59. Kozoll, D. D., and Meyer, K. A.: Massively bleeding gastroduodenal ulcers. General factors influencing incidence and mortality, Arch. Surg., 86:445, 1963.

60. Kozoll, D. D., and Meyer, K. A.: Symptoms and signs in the prognosis of massively bleeding gastroduodenal ulcer, Am. J. Surg., 106:879, 1963.

61. Kyle, J., Steyn, J. H., Bell, T. M., and Mercer, S.: Acute recurrent intussusception, Surg., Gynec. & Obstet., 117:323, 1963.

62. Laufman, H., Nora, P. F., and Bahuth, J. J.: Limited usefulness of serum lactic dehydrogenase activity as a test for strangulation obstruction, Am. J. Surg., 105:233, 1963.

63. Lepley, D., Jr., Weisfeldt, M., Close, A. S., Schmidt, R., Bowler, J., Kory, R. C., and Ellison, E. H.: Effect of low molecular weight dextran on hemorrhagic shock, Surgery, 54:93, 1963.

64. Li, F. W. P.: Surgical treatment of typhoid perforation of the intestine, Brit. J. Surg., 50:976, 1963.

65. Lister, J., McNeill, I. F., Marshall, V. C., Plzak, L. F., Dagher, F. J., and Moore, F. D.: Transcapillary refilling after hemorrhage in normal man: Basal rates and volumes; effect of norepinephrine, Ann. Surg., 158:698, 1963.

66. Marston, A.: Causes of death in mesenteric arterial occlusion: I. Local and general effects of devascularization of the bowel, Ann. Surg., 158:952, 1963.

67. Marston, A.: Causes of death in mesenteric arterial occlusion: II. Observations of revascularization of the ischemic bowel, Ann. Surg., 158:960, 1963.

68. Mason, J. H., Roberts, S. S., and Hunter, J. A.: Malrotation in the newborn period with jaundice, Am. J. Surg., 106:986, 1963.

69. McCabe, R., and Knox, W. G.: Phytobezoar in gastrectomized patients. A cause of small bowel obstruction, Arch. Surg., 86:264, 1963.

70. McCutcheon, A. D., and Race, D.: Experimental pancreatitis: Use of a new antiproteolytic substance, Trasylol, Ann. Surg., 158:233, 1963.

71. McGowan, G. K., and Walters, G.: The value of measuring central venous pressure in shock, Brit. J. Surg., 50:821, 1963.

72. Merendino, K. A., Dillard, D. H., and Cammock, E. E.: The concept of surgical biliary decompression in the management of liver trauma, Surg., Gynec. & Obstet., 117:285, 1963.

73. Miller, R. E., Moscarella, A. A., and Fitzpatrick, H. F.: Local gastric hypothermia, Arch. Surg., 86:272, 1963.

74. Moore, T. C., and Baker, W. H.: Operative and radiologic relief of gallstone intestinal obstruction, Surg., Gynec. & Obstet., 116:189, 1963.

75. Nabseth, D. C., and Jones, J. E.: Gangrene of the lower extremities of infants after femoral venipuncture. Report of two cases, New Engl. J. Med., 268:1003, 1963.

76. Nassif, A. C., Nolan, T. R., and Corcoran, A. C.: Angiotensin II in treatment of hypotensive states, J.A.M.A., 183:751, 1963.

77. Nelson, R. M., Poulson, A. M., Lyman, J. H., and Henry, J. W.: Evaluation of tris (hydroxymethyl) aminomethane (THAM) in experimental hemorrhagic shock, Surgery, 54: 86, 1963.

78. Nemir, P., Hoferichter, J., and Drabkin, D. L.: The protective effect of proteinase inhibitor in acute necrotizing pancreatitis, Ann. Surg., 158:655, 1963.

79. Orloff, M. J., and Thomas, H. S.: Pathogenesis of esophageal varix rupture. A study based on gross and microscopic examination of the esophagus at the time of bleeding, Arch. Surg., 87:301, 1963.

80. Palmerio, C., Zetterstrom, B., Shammash, J., Euchbaum, E., Frank, E., and Fine, J.: Denervation of the abdominal viscera for the treatment of traumatic shock, New. Engl. J. Med., 269:709, 1963.

81. Peck, D. A., Lynn, H. B., and DuShane, J. W.: Intussusception in children, Surg., Gynec. & Obstet., 116:398, 1963.

82. Poulos, E.: Hepatic resection for massive liver injuries, Ann. Surg., 157:525, 1963.

83. Richardson, W. R.: The role and management of enterostomy in intestinal obstruction in infants, Am. J. Surg., 106:581, 1963.

84. Robb, H. J.: The role of micro-embolism in the production of irreversible shock, Ann. Surg., 158:685, 1963.

85. Rothwell-Jackson, R. L.: Idiopathic large-bowel obstruction, Brit. J. Surg., 50:797, 1963.

86. Royster, H. P., Harrison, J. M., and Martin, C. J.: Acute perforated peptic ulcer. Treatment by primary definitive surgery, Arch. Surg., 86:230, 1963.

87. Saidi, F., and Donaldson, G. A.: Acute pancreatitis following distal gastrectomy for benign ulcer, Am. J. Surg., 105: 87, 1963.

88. Samueloff, S. L., Luttwak, E. M., and Wigderhouse, B. M.: Acid-base balance changes in citrated bank blood, Arch. Surg., 87:1029, 1963.

89. Santschi, D. R., Huizenga, K. A., Scudamore, H. H., Dearing, W. H., and Waugh, J. M.: Bile ascites, Arch. Surg., 87:851, 1963.

90. Sautter, R. D., Lawton, B. R., Magnin, G. E., and Emanuel, D. A.: Pulmonary embolectomy. Report of a case with preoperative and postoperative angiograms, New Engl. J. Med., 269:997, 1963.

91. Schumer, W., and Durrani, K. M.: Study of effects of norepinephrine on microcirculation of the dog omentum in oligemic shock, Ann. Surg., 158:982, 1963.

92. Shaftan, G. W., Gliedman, M. L. and Cappelletti, R. R.: Injuries of the liver: A review of 111 cases, J. Trauma, 3:63, 1963.

93. Shaw, R. S., and Baue, A. E.: Management of sepsis complicating arterial reconstructive surgery, Surgery, 53:75, 1963.

94. Shinowara, G. Y., Stutman, L. J., Walters, M. I., Ruth, M. E., and Walker, E. J.: Hypercoagulability in acute pancreatitis, Am. J. Surg., 105:714, 1963.

95. Sieber, W. K., and Girdany, B. R.: Functional intestinal obstruction in newborn infants with morphologically normal gastrointestinal tracts, Surgery, 53:357, 1963.

96. Simeone, F. A.: Shock, trauma and the surgeon, Ann. Surg., 158:759, 1963.

97. Smith, L. L., Foran, R., and Gaspar, M. R.: Acute arterial injuries of the upper extremity, Am. J. Surg., 106:144, 1963.

98. Smith, R. B., Orahood, R. C., Wangensteen, S. L., Berakha, G. J., and Zamelis, A.: Effect of a trypsin-inhibitor on experimentally induced pancreatitis in the dog, Surgery, 54:922, 1963.

99. Smith, R. F., Szilagyi, D. E., and Pfeifer, J. R.: Arterial trauma, Arch. Surg., 86:825, 1963.

100. Solheim, K.: Acute intestinal infarction: Acute mesenteric vascular occlusion, Acta Chir. Scand., 126:133, 1963.

101. Souliotis, P. T., Pettgrew, A. H., and Chamberlain, J. W.: Traumatic hemobilia, New Engl. J. Med., 268:565, 1963.

102. Spencer, F. C., Menguy, R., and Eiseman, B.: Operative cholangiography in management of traumatic hemobilia, Surgery, 54:376, 1963.

103. Spittell, J. A., Jr., Palumbo, P. J., Love, J. G., and Ellis, F. H., Jr.: Arteriovenous fistula complicating lumbar-disk surgery, New Engl. J. Med., 268:1162, 1963.

104. Starzl, T. E., and Sanders, R. J.: A maneuver for detection of the site of gastric hemorrhage, Surg., Gynec. & Obstet., 116:121, 1963.

105. Steenburg, R. W., and Ravitch, M. M.: Cervico-thoracic approach for subclavian vessel injury from compound fracture of the clavicle: Considerations of subclavian-axillary exposures, Ann. Surg., 157:839, 1963.

106. Stoney, W. S., Jr., Jacobs, J. K., and Collins, H. A.: Pulmonary embolism and embolectomy, Surg., Gynec. & Obstet., 116:292, 1963.

107. Strahan, R. W., Sajedee, M., and DuVal, M. K.: The leaking esophageal suture line. A new method of repair using Eastman 910 adhesive, Am. J. Surg., 106:570, 1963.

108. Thal, A. P., Kobold, E. E., and Hollenberg, M. J.: The release of vasoactive substances in acute pancreatitis, Am. J. Surg., 105:708, 1963.

109. Thaler, M. M., and Stobie, G. H.: An improved technic of external cardiac compression in infants and young children, New Engl. J. Med., 269:606, 1963.

110. Thompson, B. W., and Lipin, R. J.: Propylthiouracil in hemorrhagic pancreatitis, Arch. Surg., 86:243, 1963.

111. Thompson, N. W.: Ischemic necrosis of proximal gastric remnant following subtotal gastrectomy, Surgery, 54:434, 1963.

112. Thoren, L.: Bile peritonitis, II. Experimental studies of plasma volume loss, haptoglobin concentration in serum and kidney lesions in bile peritonitis, Acta Chir. Scand., 126: 114, 1963.

113. Tolstedt, G. E., Jesseph, J. E., and Bell, J. W.: Late intestinal complications of abdominal aortic homografts, Surg., Gynec. & Obstet., 116:42, 1963.

114. Turner, G. R., Hinshaw, D. B., Carter, R., and Vannix, R. S.: Local gastric hypothermia in management of massive upper gastrointestinal hemorrhage, Surgery, 53:609, 1963.

115. Tuttle, W. M., and Barrett, R. J.: Late esophageal perforations, Arch. Surg., 86:695, 1963.

116. Vick, J. A., LaFave, J. W., and MacLean, L. D.: Effect of treatment of endotoxin shock on renal hemodynamics and survival, Surgery, 54:78, 1963.

117. Waldhausen, J. A., Herendeen, T., and King, H.: Necrotizing colitis of the newborn: Common cause of perforation of the colon, Surgery, 54:365, 1964.

118. Wangensteen, S. L., Orahood, R. C., Voorhees, A. B., Smith, R. B., III, and Healey, W. V.: Intragastric cooling in the management of hemorrhage from the upper gastrointestinal tract, Am. J. Surg., 105:401, 1963.

119. Whitcomb, J. G., Bromme, D. A., and Lovelace, W. R.: Barium enema reduction of gallstone ileus, Am. J. Surg., 106:592, 1963.

120. Wilder, R. J., Weir, D., Rush, B. F., and Ravitch, M. M.: Methods of coordinating ventilation and closed chest cardiac massage in the dog, Surgery, 53:186, 1963.

121. Williams, J. R., Wilcox, W. C., Andrews, G. J., and Burns, R. R.: Angiography in pulmonary embolism, J.A.M.A., 184:473, 1963.

122. Williams, R. D., and Sargent, F. T.: The mechanism of intestinal injury in trauma, J. Trauma, 3:288, 1963.

123. Wolfman, E. F., Jr., Neill, S. A., Heaps, D. K., and Zuidema, G. D.: Donor blood and isotonic salt solution. Effect on survival after hemorrhagic shock and operation, Arch. Surg., 86:869, 1963.

124. Yanoff, M.: Incidence of bone-marrow embolism due to closed-chest cardiac massage, New Engl. J. Med., 269:837, 1963.

125. Young, J. R., Humphries, A. W., DeWolfe, V. G., and LeFevre, F. A.: Peripheral arterial embolism, J.A.M.A., 185:621, 1963.

126. Young, J. R., Humphries, A. W., DeWolfe, V. G., and LeFevre, F. A.: Complications of abdominal aortic surgery. II. Intestinal ischemia, Arch. Surg., 86:51, 1963.

CASE REPORTS

Coexistence of Multiple Myeloma and Paget's Disease of Bone

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Orange



Figure 1.—Posterior-anterior film of pelvis and upper femurs demonstrate classic changes of Paget's disease of bone, expansion of cortex, coarsening of trabeculations and bone sclerosis.

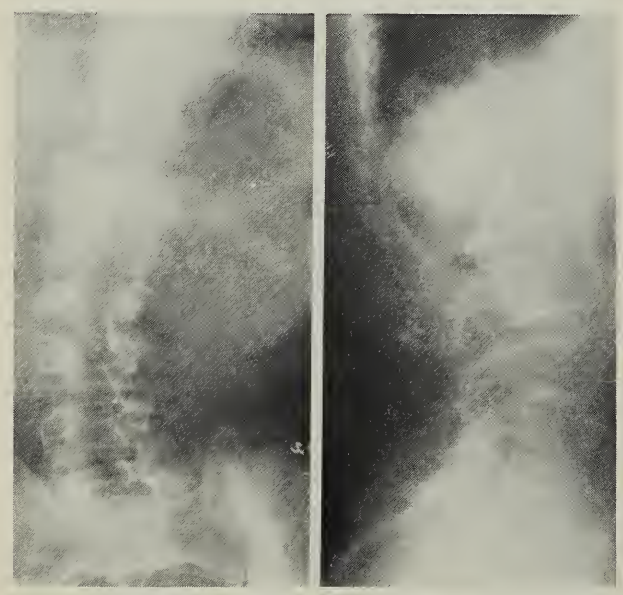


Figure 2.—Posterior-anterior and lateral of spine x-ray films (for discussion, see text).

THE COEXISTENCE of multiple myeloma and Paget's disease of bone is extremely rare. At the Wadsworth General Hospital (Veterans Administration Hospital, West Los Angeles) in the period 1953 through 1961, there were 99 patients with Paget's disease of bone and 85 with multiple myeloma, none with both diseases coexisting. Recently, however, the author studied one patient with both diseases at this hospital.

Report of a Case

A 47-year-old Negro man was admitted for the first time to the Wadsworth General Hospital on December 14, 1962, because of "Paget's disease of bone and high blood pressure." Bilateral hip pain began in May 1962, and was accompanied soon afterward by lower thoracic vertebral pains. On June 15, 1962, roentgenograms demonstrated the classic findings of Paget's disease of bone in the left ilium, left ischium and right femur. Blood studies that had been done in 1942 because of a febrile illness showed no anemia but on many determinations the number of leukocytes varied between 4,000 and 6,000 per cu mm with the proportion of lymphocytes ranging from 52 to 83 per cent. In a specimen of bone marrow aspirate the proportion of lymphocytes was 20 per cent.

On physical examination when admitted to the Wadsworth General Hospital the patient appeared well-developed, well-nourished and younger than his chronological age. He was alert and cooperative and

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stuttered. The blood pressure was 170/100 mm of mercury, the pulse rate 90, body temperature 98.4° F. Optic fundi appeared normal. Some diminution in hearing was noted bilaterally. The lungs were clear to auscultation. The heart was enlarged to the left and a Grade II systolic precordial murmur was heard. The liver, spleen and kidneys were not palpable. There was decided lordosis of the lumbar spine. No bone or joint deformities were noted. No abnormalities were observed on neurological examination.

X-ray films of the chest showed a 20 per cent increase in the transverse diameter of the heart. X-ray studies of the pelvis and femurs demonstrated classical features of Paget's disease (Figure 1). Films of the spine showed narrowing of the bodies of the 11th and 12th thoracic vertebrae, poor definition of the bodies of the 12th thoracic and first lumbar and narrowing of the space between the 12th thoracic vertebra and the lumbar spine (Figure 2). Additional x-ray studies of bones revealed Paget's disease of the left humerus. Radiographic studies of the skull and the gastrointestinal tract showed no abnormalities. Before multiple myeloma was diagnosed, an intravenous pyelogram demonstrated normal kidney outlines and normal excretion of the dye.

Alkaline phosphatase (King-Armstrong units) values were all very high. A trace of protein was found in the first urinalysis, but all determinations thereafter were normal. The thymol turbidity test revealed very high values. Results of direct Coombs tests were positive on two occasions, negative on another. Total serum proteins were elevated, with a reversal of the albumin-globulin ratio. Serum electrophoresis showed a paraproteinemic peak in the gamma area compatible with multiple myeloma. Ultracentrifugation of serum showed less than normal S_{19} macroglobulins. The patient was not anemic, and leukocytes numbered between 4,400 and 8,000 per cu mm, with lymphocytosis always present. The erythrocyte sedimentation rate (Wintrobe) was never over 5 mm in an hour. Protein content of a 48-hour urine specimen was 162 mg. Electrophoresis of the urine showed only albumin. Bone marrow aspirate contained numerous plasma cells, and in some areas atypical plasma cells. As determined by the dye dilution method, the cardiac output was 8.76 liters per minute and the cardiac index was 5.28 liters per minute per square meter of body surface. (Normal values are 5 to 6 liters and 3 to 3.5 liters, respectively). Circulation time was 10 seconds (arm to tongue); venous pressure was 150 mm of water. An electrocardiogram was within normal limits. See Table 1 for a portion of the laboratory data.

A diagnosis of multiple myeloma was made on the basis of a characteristic electrophoretic pattern and a pathologist's report that the bone marrow aspirate showed plasma cells "replace approximately 30 to 40 per cent of marrow and they are immature and atypical."

TABLE 1.—*Laboratory Data*

	Dec. 17 1962	*Feb. 5 1963*
Serum creatinine (mg per 100 ml)	1.0	1.0
Serum phosphorus (mg per 100 ml)	4.3	3.4
Serum calcium (mg per 100 ml)	9.6	10.4
Total serum protein (gm per 100 ml)	8.25	8.6
Albumin (gm per 100 ml)	3.68	3.7
Globulin (gm per 100 ml)	4.57	4.9
Serum uric acid (mg per 100 ml)	6.4	5.8
Thymol turbidity (units)	25	16.7
Alkaline phosphatase (King-Armstrong units)	130	78
Coombs, direct	positive	negative
Urinary Bence-Jones protein	negative	negative
Hemoglobin (gm per 100 ml)	13.9	14.6
Hematocrit (%)	43	43
Leukocytes (per cu mm)	5100	5600
Polymorphonuclears (%)	47	41
Lymphocytes (%)	48	57
Monocytes (%)	2	3
Sedimentation rate (mm per hr, Wintrobe)	2	5

The patient's only complaint during the first few weeks in hospital was of pain in both hips. This pain gradually disappeared, and he became totally asymptomatic and ambulatory. Because of the osteoporosis at the 12th thoracic vertebra, a back brace was fitted. The necessity for ambulation as a part of therapy was emphasized. Testosterone propionate, 50 mg per day intramuscularly, was begun on February 7, 1963, and on February 15 the daily injections were discontinued and 200 mg of depo-testosterone was given every two weeks.

The patient was last seen in December 1963, and appeared to be in excellent health although results of bone marrow studies and serum protein determinations remained unchanged.

Review of the Literature

Rosenkrantz and Gluckman[4] reviewed the records of discharged patients from ten city and voluntary hospitals in and about New York City and found only two patients, among 1,955,428, who had both Paget's disease of bone and multiple myeloma. As part of their survey, these investigators reported that from 1949-1952 there were 1,000,000 patients admitted and 1,900,000 general diagnoses made in all Veterans Administration Hospitals. Among these, there were 1,136 patients with Paget's disease of bone and 900 with multiple myeloma. Only two had both diseases. To date the literature contains reports of only nine cases of coexistent Paget's disease of bone and multiple myeloma.[1-6] Of the nine, only six were described in some detail. The patient reported

here is the only Negro and the youngest of those with both diseases. Five of the six patients reported in the literature were male. The diagnosis of Paget's disease of bone was made on radiographic evidence, and multiple myeloma was diagnosed by the usual criteria. The alkaline phosphatase values, which varied from 2.3 to 14.9 Bodansky units in the six cases, were low for Paget's disease of bone alone.

Summary

A 47-year-old Negro man with coexistent multiple myeloma and Paget's disease of bone entered the hospital with complaint only of bilateral hip pain and lower thoracic pain. Soon after hospitalization he became asymptomatic. He was not anemic, but he did have leukopenia and relative lymphocytosis. The erythrocyte sedimentation rate was not increased. Serum electrophoresis showed a peak in the gamma area. The diagnosis of multiple myeloma was confirmed by the bone marrow aspirate. Thymol turbidity measurement was decidedly above normal and the result of a direct Coombs test was positive. Alkaline phosphatase values were elevated. Hypercalcemia and Bence-Jones proteinuria were not present. Kidney function was good. The diagnosis of Paget's disease of bone was made on x-ray evidence. A review of the nine cases in the world literature revealed relatively low alkaline phosphatase values for most. Intramuscular depotestosterone, 200 mg every two weeks, was given and the patient was free of subjective symptoms.

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REFERENCES

1. Gross, R. J., and Yelin, G.: Multiple myeloma complicating Paget's disease, Am. J. Roentgenol. and Radium Therapy, 65:585, 1951.

2. Hanisch, C. M.: Paget's disease complicated by multiple myeloma, Bulletin of the Hospital for Joint Diseases, 2:43, 1950.

3. Reich, C., and Brodsky, A. E.: Coexisting multiple myeloma and Paget's disease of bone treated with stilbamidine, J. Bone and Joint Surgery, 30A:642, 1948.

4. Rosenkrantz, J. A., and Gluckman, E. C.: Coexistence of Paget's disease of bone and multiple myeloma, Am. J. Roentgenol., Radium Therapy and Nuclear Medicine, 78:30, 1957.

5. Schmorl, G.: Fall von Myeloma, Munchen med. Wchnschr., 59:2891, 1912.

6. Snapper, I., Turner, L. B., and Moscovitz, H. L.: Multiple Myeloma, New York, 1953, Grune & Stratton, Inc.

Cold Agglutinin Disease

A Report of Spontaneous Remission

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IDIOPATHIC COLD AGGLUTININ DISEASE is a very rare process. It is characterized by an extraordinarily high titer of serum cold agglutinins and the unique clinical constellation of Raynaud's phenomenon, chronic hemolytic anemia and hemoglobinuria following exposure to cold. Typically, the patient is a man in the sixth to ninth decade of life.[8] Following sudden although often insignificant exposure to cold, symptoms of acute hemolysis ensue rapidly, with muscle aching, headache, malaise, fever and chills. Hemoglobinuria and acrocyanosis soon follow. Recovery from the hemolytic episode is usually rapid; between attacks the patient may be entirely normal.

This material has been reviewed by the Office of The Surgeon General, Department of the Army, and there is no objection to its presentation and/or publication. This review does not imply any indorsement of the opinions advanced or any recommendations of such products as may be named, June 26, 1963.

Presented at the USARPAC Medical-Surgical Conference, June 4, 1963.

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Report of a Case

A 40-year-old white carpenter was admitted to the U. S. Army Tripler General Hospital on March 22, 1962, with complaint of weakness and malaise related to severe cryptogenic anemia which had first been discovered in mid-October, 1960. Before this time, the patient had been robust and well; he had worked as a carpenter for many years on outdoor construction projects in cold temperatures often as low as minus 70° F.

The first attack came without premonition one morning while he was working on a highway in northern California. He noted sudden cyanosis of his hands and ears, followed by an alarming and repeated passage of "coffee-black" urine. The patient said that "blood and urine examinations" were performed the following day (which was quite a bit warmer and no abnormalities were noted. Then, within five days hemoglobinuria re-

turned and the patient was referred to a local internist. Results of laboratory studies at that time were as follows: Hemoglobin, 10 gm per 100 ml; serologic test for syphilis (VDRL) negative; leukocytes, 5,480 per cu mm with a Schilling differential count within normal limits. The result of a Rosenbach test was positive. The cold agglutinin titer was 1:2,048 and the results of direct Coombs tests both before and after chilling of the red blood cells were weakly positive. The Donath-Landsteiner phenomenon was not present and the results of a cold hemolysin test and a red cell fragility test were normal. On examination of bone marrow aspirate significant normoblastic activity and abundant megakaryocytes were noted. The myelogenous cell series was not remarkable.

Acrocyanosis and hemoglobinuria followed each exposure to cold. During the summer of 1961, all symptoms abated and exhausting physical activity did not provoke an attack. In October, 1961, all symptoms recurred with cold weather and the patient was unable to remain outdoors. In early March, 1962, hemoglobin was 4.8 gm per 100 ml and transfusions of whole blood were given. Typing and cross-matching at this time was quite difficult at room temperature due to rapid agglutination of erythrocytes. The patient was advised to move to a warm climate and he migrated to Hawaii. On admittance to hospital the patient was extremely pale and appeared to be in moderate distress. Blood pressure was 120/82 mm of mercury, the pulse rate 80 at rest and when the patient sat up the pulse rose to 100 and was barely palpable. Respirations were 16 per minute and the body temperature 99° F. The retinas were pale with fresh-appearing small scattered hemorrhages and several larger flame-shaped hemorrhages along the veins. Mucous membranes were remarkably pale; there was no evident jaundice. Except for a soft, short systolic ejection sound along the left sternal border, the remainder of the physical examination was within normal limits.

Because of the profound anemia (hemoglobin 4.5 gm per 100 ml, hematocrit 13 per cent) two units of packed whole blood were preheated to 37° C and given to the patient. Cross-matching was extremely difficult; clumping and hemolysis of the erythrocytes occurred in the syringe as soon as the blood was drawn. Leukocytes numbered 3,400 per cu mm—58 per cent polymorphonuclear cells, 2 per cent metamyelocytes and 4 per cent myelocytes. The sedimentation rate was 75 mm in one hour at 20° C. Hemolysis occurred at room temperature with no acceleration upon cooling and reheating. Erythrocyte osmotic fragility was normal and the direct Coombs test was weakly positive at 37° C and 20° C. No acid hemolysins or cryoglobulins could be demonstrated. Serum and urine hemoglobin and bilirubin were unremarkable, the result of a Sia water test was equivocally positive and a formol gel test inconclusive. Hemoglobin electrophoresis showed hemoglobin A and 1 per cent fetal hemoglobin. Results of a serological test for syphilis, a Fishbach test for urinary hemosiderin and of stools for occult blood were negative. Serum iron was 230 gamma per 100 ml; total serum iron binding capacity 259 gamma per 100 ml. Prothrombin consumption time was 50 seconds (control 60 seconds); prothrombin time was 70 per cent of normal.

Repeated studies indicated very mild continuing hemolysis with fairly brisk reticulocytosis. Serum electrophoresis obtained one month after admission was normal. Chromium-51 studies showed a progressive increase in erythrocyte survival time—23 days on the 10th day of measurement, 54 on the 24th day and 85 on the 36th. Marrow biopsy on April 6, 1962, showed nonspecific histiocytosis but no erythroid or myeloid hyperplasia. Megakaryocytes were normal in number and appearance.

Following three blood transfusions, and despite persistence of brisk reticulocytosis, the hematocrit remained around 21 per cent up to the time the patient was discharged from hospital on April 27, 1962. He was advised to report to the hematology clinic. A hematocrit of 32 per cent was recorded on May 14, 1962. It was 41 per cent on June 11, 1962. No clinical or laboratory evidence of hemolysis could be detected. Neither the liver nor the spleen was enlarged. The patient had resumed his occupation as a carpenter on outdoor construction without ill effect. A bone marrow examination on August 14, 1962, showed normal cellularity, orderly erythroleukogenesis, a leukocyte-erythrocyte ratio of 2:1, adequate megakaryocytes and no abnormal cells. On examination of peripheral blood, rare nucleated erythrocytes and mild relative lymphocytosis were noted. An incidental observation was the ease with which specimens of blood could be obtained at this time. There was little or no clumping.

Serum protein studies* showed a small homogeneous fraction in the gamma globulin range (paper electrophoresis) and an increase in the macroglobulin (ultracentrifugation and immunoelectrophoretic determination). Pronounced hyper-Beta-2-M-globulinemia was present; the cold agglutinin titer at 4° C was 1:8,192 and the acid cold hemolysin titer, 1:2. (It was the opinion of Drs. Ritzmann and Levin of the Hematology Research Laboratory that this serum protein pattern was compatible with cold agglutinin disease but that malignant lymphomas could not be excluded.)

*Done by the Hematology Research Laboratory, University of Texas Medical Branch.

On November 19, 1962, the patient was again put in hospital, this time for acute prostatitis. Meanwhile since August, 1962, he had done well except for one episode of "blotchiness" of the hands after he had carried a cold package for a half hour. No hemoglobinuria resulted. Results of laboratory studies were as follows: Direct and indirect Coombs tests at 37° C, negative; total serum protein 7.7 gm per 100 ml with a normal electrophoretic pattern, total bilirubin 0.5 mg per 100 ml; Sia water and formol gel test, negative; cold agglutinin titer 1:80; Donath-Landsteiner phenomenon and cold hemolysins absent. Leukocytes numbered 7,500 per cu mm with the cell differential within normal limits, the hematocrit was 46 per cent and hemoglobin content was 15.3 gm per 100 ml. No abnormalities were seen in an excretory urogram or in radiographs of the skull.

Discussion

In normal persons serum macroglobulins or cold agglutinins are present in titers of 1:4 to 1:128; in primary atypical pneumonia titers of 1:256 to 1:64,000 may be attained. In "idiopathic cold agglutinin disease," titers of 1:8,000 to 1:1,000,000 have been reported.[4] The cold agglutinins present in these differing clinical situations may be identical and differ only in quantity.[5] They are autoimmune agglutinins characterized by electrophoresis as gamma$_1$-beta$_2$ globulins; upon ultracentrifugation they sediment as the "M" peak with a sedimentation constant of 15 to 19 Svedberg units. When subjected to immunoelectrophoresis they are revealed as beta-2-M-globulins (19 S-gamma globulin or gamma-macroglobulin)[7]; molecular weight is about one million. The other two immunoglobulins, gamma globulin and beta-2-A globulin, have molecular weights of 60,000. The beta-2-M-globulins are polymers of globulins which are similar but not identical to gamma globulins.

The temperature at which agglutination and hemolysis of erythrocytes (both phenomena apparently related to the macroglobulins[5]) occur in the presence of these proteins is apparently a function of titer. Under normal conditions, erythrocyte cold-hemagglutination occurs at less than 10° C; in primary atypical pneumonia it will take place up to 20° C; in the extremely high titers found in idiopathic cold agglutinin disease, this phenomenon will occur at skin temperature (32° C).[4]

The case here reported is unique from several aspects. The relative youth of the patient, sudden onset of disease after many years of cold exposure, apparent decrease in the thermal range of activity of the macroglobulins during the period of observation, and the presence of marrow histiocytes are atypical features.

Most patients reported with cold agglutinin disease have been considerably older than the patient in this case. Ritzmann and Levin[4] described a 65-year-old man with a six-year history of disease. The two patients reported by Hillestad were 58 and 66 years of age. One was a man with a six-year history, the other a woman with a four to six-year history. Mackay[3] described a 66-year-old man with a two to four-year duration of illness.

Of particular interest from the aspect of our patient's age and sex is the similarity of cold agglutinin disease to the macroglobulinemia of Waldenström. Ritzmann and Levin[6] expressed belief that "macroglobulinemia Waldenström . . . may be considered to be the prototype of primary macroglobulinemia . . . [and that] cold agglutinin disease is another type of primary macroglobulinemia with more circumscribed clinical manifestations." Bone marrow aspirates from patients with the macroglobulinemia of Waldenström and cold agglutinin disease are both characterized by mast cells and "large numbers of lymphoid reticular elements . . . and transitional stages between lymphocytic, plasmocytic and reticulum cells.[6]

Fudenberg and Kunkel[1] described a 78-year-old Negro man with high titer cold hemagglutination, Raynaud's phenomenon, chronic hemolytic anemia and paroxysmal hemoglobinuria for at least 15 years. The bone marrow resembled that seen in some cases of Waldenström's macroglobulinemia.

The course of the disease in the present case is of considerable interest as well. It began suddenly about 18 months before admission during a period of continuous exposure to low ambient temperatures and after a preceding period of exposure to extremely low temperatures. At that time there was no clinical evidence of an associated viral illness. Upon admission to hospital it was obvious from the physical characteristics of the blood that the hemagglutination titer was extremely elevated (probably over 1:100,000).[4] Unfortunately, immunochemical, electrophoretic and cold agglutination studies of the blood could not be performed at the time. An early examination of bone marrow showed extensive infiltration with reticuloendothelial cells considered to be histiocytes. Four months later, when the patient was asymptomatic and no longer anemic, no abnormalities were noted in the bone marrow. The thermal sensitivity of the blood was decreasing sharply during this asymptomatic interval, as was indicated by the ease of obtaining blood samples and of making blood smears which did not agglutinate. The cold agglutinin titer in November, 1962, was also noted to have decreased (1:80).

A clearly defined explanation for the sudden development of high-titer cold hemagglutinin disease,

followed in 18 months by a spontaneous remission, is not forthcoming. Hidden lymphoma is considered unlikely in this case in view of the prolonged history and the absence of hepatosplenomegaly, lymphadenopathy and paraproteinemia (qualitative variant of the beta-2-M-globulin). This possibility has not been completely excluded, however. Variability in production of immunoglobulins as demonstrated in the present case has been observed in certain probable viral diseases: in primary atypical pneumonia, the so-called "Wasserman positive" pulmonary infiltration is attended by the evanescent appearance of "Wasserman" antibodies; in infectious mononucleosis there is heterophil antibody production.[7] In the present case, however, no evidence of disease other than that which could be directly attributed to the high titers of cold agglutinins was present. It is interesting to speculate on the possibility that the cold hemagglutinin titer decreased following withdrawal of the stimulus for its production—cold weather.

Summary

A case of spontaneously resolving "cold agglutinin disease" is described in a 40-year-old man after 18 months of intermittent acrocyanosis, hemoglobinuria and severe chronic hemolytic anemia. The characteristics of the abnormal macroglobulins are delineated. The possible relationship to Waldenström's macroglobulinemia is discussed.

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REFERENCES

1. Fudenberg, H. H., and Kunkel, H. G.: Physical properties of the red cell agglutinins in acquired hemolytic anemia, J. Exp. Med., 106:689-702, 1957.

2. Hillestad, L. K.: The peripheral circulation during exposures to cold in normals and in patients with the syndrome of high-titre cold haemagglutination. II. Vascular response to cold exposure in high-titre cold haemagglutination, Acta. Med. Scand., 164:211-217, 1959.

3. Mackay, I. R., Eriksen, N., Motulsky, A. G., and Volwiler, W.: Cryo- and macroglobulinemia; electrophoretic, ultracentrifugal and clinical studies, Amer. J. Med., 20:564-587, 1956.

4. Ritzmann, S. E., and Levin, W. C.: Effect of mercaptanes in cold agglutinin disease, J. Lab. Clin. Med., 57(5): 718-732, 1961 (May).

5. Ritzmann, S. E., and Levin, W. C.: Cryopathies: A review, Arch. Intern. Med., 107:754-772, 1961 (May).

6. Ritzmann, S. E., and Levin, W. C.: Cold agglutinin disease. A type of primary macroglobulinemia: A new concept, Texas Rep. Biol. Med., 20(2):236-250, 1962.

7. Ritzmann, S. E., Lang, P. A., and Levin, W. C.: Multiple paraproteinemia with cold agglutinin syndrome in malignant lymphoma, Texas Rep. Biol. Med., 20(2): 251-270, 1962.

8. Rosen, F. S.: The macroglobulins, New Eng. J. Med., 267:491-497, 546-550, 1962 (Sept).

9. Wintrobe, M. M.: Clinical Hematology, 5th ed. Philadelphia, Lea & Febiger, p. 638, 1961.

The Immediate Use of a Massive Direct Pedicle Graft for Extensive Injuries of the Forearm

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In reconstructive surgery, one of the major challenges is the immediate or delayed demand for massive replacement of tissue in extensive injuries of the forearm. The selection of a method of primary or staged reconstruction of such a defect requires sound surgical judgment. If the motor and sensory functions of the hand are to be preserved, the integrity of the forearm must be maintained and its potentially viable bones, tendons and nerve tissues protected. Of the techniques available, grafting of a direct lower chest-upper abdominal pedicle is generally the preferred means of reconstructing a compound defect. If primary pedicle grafting is impossible, split-skin grafting or open management for drainage are alternate methods. Because a split-skin graft is dependent on the recipient area for its revascularization, it is not usually as satisfactory for reconstruction of a compound defect as is a pedicle graft.

The pedicle is a composite of skin and subcutaneous tissue supported by a lifeline supply of blood at its base during attachment. The recipient area will ultimately provide collateral circulation that will sustain the transferred tissue after division of its base. During transfer of the pedicle the peripheral and deeper plane collateral blood vessels will have been divided to mobilize the tissue for transfer. Since the base of the pedicle will have to support the length of the graft, the length should not be more than two and a half times the width of the base, since greater lengths potentially would be embarrassed by inadequate circulation.[1]

In each case, once the plan of approach is established, several basic steps must be taken before the operation can be executed with the maximum chance of success and preservation of tissue for permanent repair.

- Debridement and preparation of a healthy recipient bed.

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Submitted December 6, 1963.

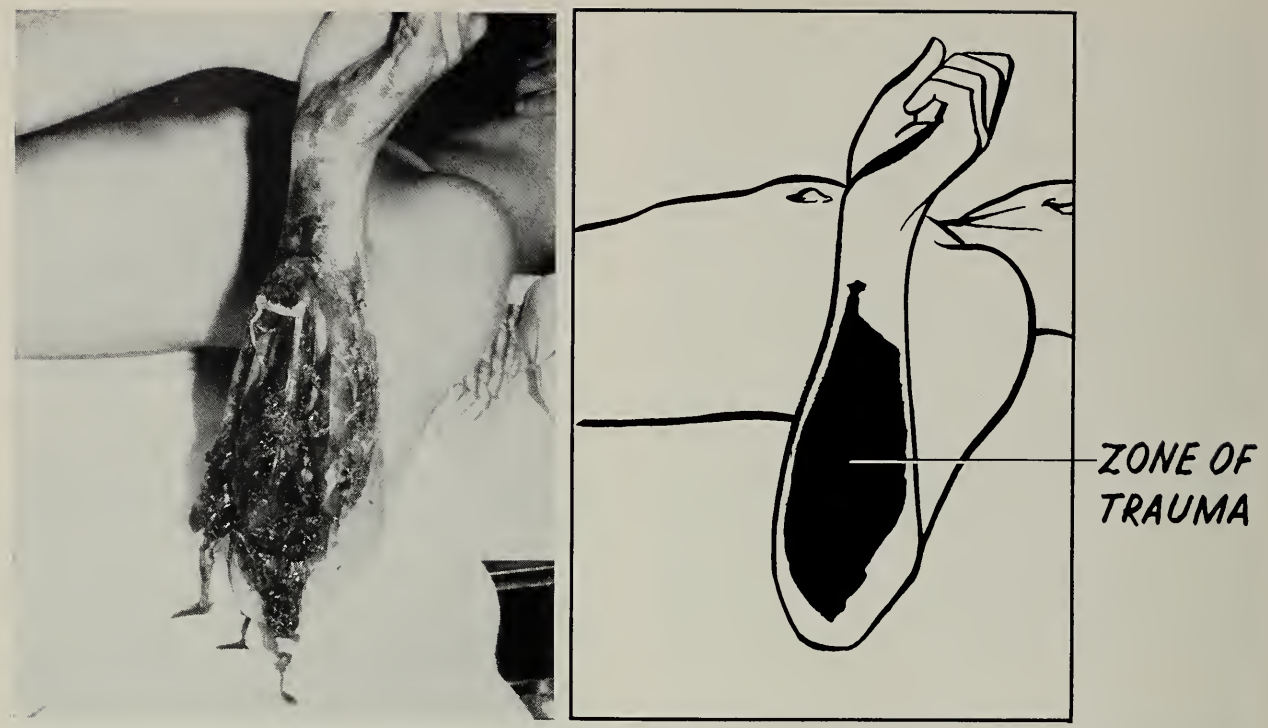


Figure 1.—Forearm wound caused by shotgun blast. Picture was taken after the wound was cleansed but before repair was begun.

- Consideration of the size of the local defect and the status of the circulation locally and distal to the defect.
- Measurement of pedicle tissue needed for reconstruction and proper orientation of the base of the pedicle for maximum use of tissue and maintenance of blood supply.
- Reconstruction of the defect at the donor site to eliminate open wounds.

The status of the circulation and the extent of functional deficit distal to the defect are of major importance. In all injuries of the forearm, the hand will provide the answer to the extent of functional deficit coexisting with the forearm injury since the three major nerves (ulnar, median and radial) can be partially or completely involved as can the extrinsic hand muscles and supporting bony architecture. Temperature, color, the presence of distal pulses, sensation and motor function of the hand must all be considered in a baseline evaluation. If, after initial evaluation, decision is made to reconstruct the tissues in the forearm, the basic plan is drawn. Debridement and preparation of the zone of trauma for proper reception of the pedicle graft are carried out. Matching the defect with an appropriate amount of pedicle tissue and incorporating in the plan enough tissue for orientation of the base and maintenance of the blood supply are essential to insure a proper pedicle transfer. Because the forearm is essentially cylindrical, the base of a direct pedicle graft may be above or below the forearm depending upon the mechanical advantage offered—that is, a superiorly-based pedicle for a defect of the radial aspect and an inferiorly-based pedicle for a defect of the ulnar aspect. A donor site should be selected for a dermatome split-thickness skin graft that will be used to reconstruct the defect on the torso created by transferring the direct pedicle.

Report of a Case

A 17-year-old boy was leaving a boat when a shotgun that he was holding by the muzzle was accidentally discharged. The blast, obliquely directed at close range to the ulnar aspect of his forearm tore away skin, subcutaneous tissue, fascia and muscle, and stripped the periosteum of the central one third of the ulna without fracturing the bone (Figure 1). Many pellets of birdshot were implanted in the soft tissue of the forearm and upper arm without causing brisk arterial bleeding. Clinical shock was absent. The hand was warm and sensation was intact over the distribution of the median and radial nerves but was slightly impaired over the distribution of the ulnar nerve. The patient could flex and extend the fingers, but individual sublimus, profundus and intrinsic motions were difficult to assess because of the traumatic involvement of the soft tissue and the pain associated with motion.

Under general anesthesia, the wound was cleansed with a half-and-half solution of liquid soap and hy-

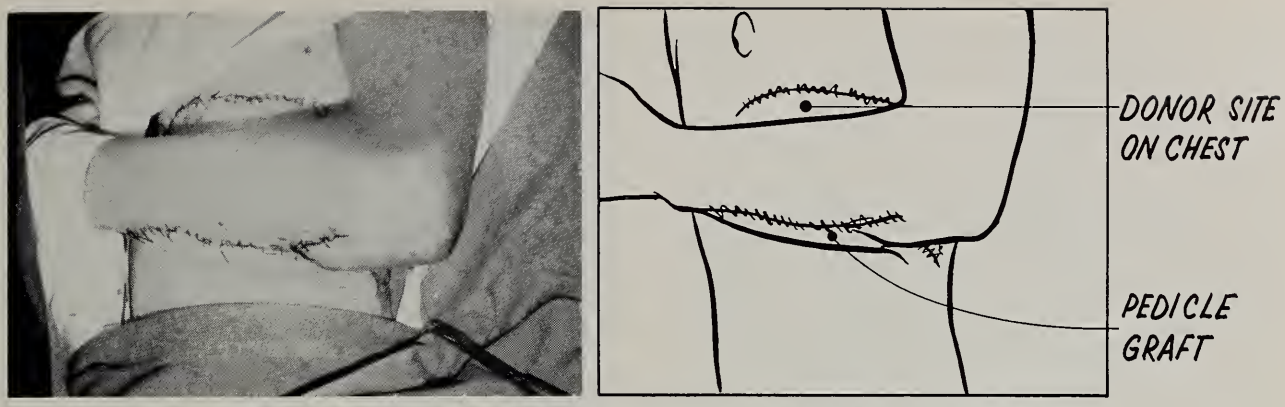


Figure 2.—Showing placement of forearm and attachment of pedicle graft.

drogen peroxide, then with alcohol, ether and copious irrigation with normal saline solution. Excision of marginal wounds and of all devitalized tissue (including flexors of the little finger) provided a good recipient bed for a pedicle graft. The ulnar nerve was exposed from elbow to wrist and was seen to be intact although there was extensive ecchymosis of perineural tissue throughout its length. The size of the defect was appraised and a massive lower chest-upper abdominal, inferiorly-based pedicle was prepared. The left thigh was selected as a donor site for the split-skin graft that would be used to reconstruct the defect at the pedicle donor site creating a closed wound in that area (Figure 2). Plaster of Paris splints and rigging were employed for immobilization of the upper extremity to permit proper healing of the transferred pedicle with drainage point dependently designed for the elbow region at a junctional zone between the transferred pedicle, split-skin graft and skin of the forearm. Color, warmth and integrity of the distal pedicle and adjacent skin on the forearm were observed throughout the postoperative period. At the end of three weeks, sufficient pedicle was carried by the forearm and transection-division of the pedicle and staged reconstruction of the forearm were accomplished.

The patient left the hospital four weeks following the injury with all wounds healed. Tentative plans were made for possible transfer of a tendon to the little finger at a later date. Six weeks after injury, healing was stable and the integrity of the forearm had been preserved by the pedicle graft (Figure 3).

Summary

The use of a massive direct, lower-chest pedicle graft in reconstructive operations on the forearm is outlined with presentation of a case. In planning primary or staged reconstruction procedures on the forearm, all efforts must be directed toward maintenance of maximum motor and sensory function of the hand.

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REFERENCE

1. Bunnell, S.: Plastic problems in the hand, Plast. and Reconst. Surg., 1:3, Nov. 1946.

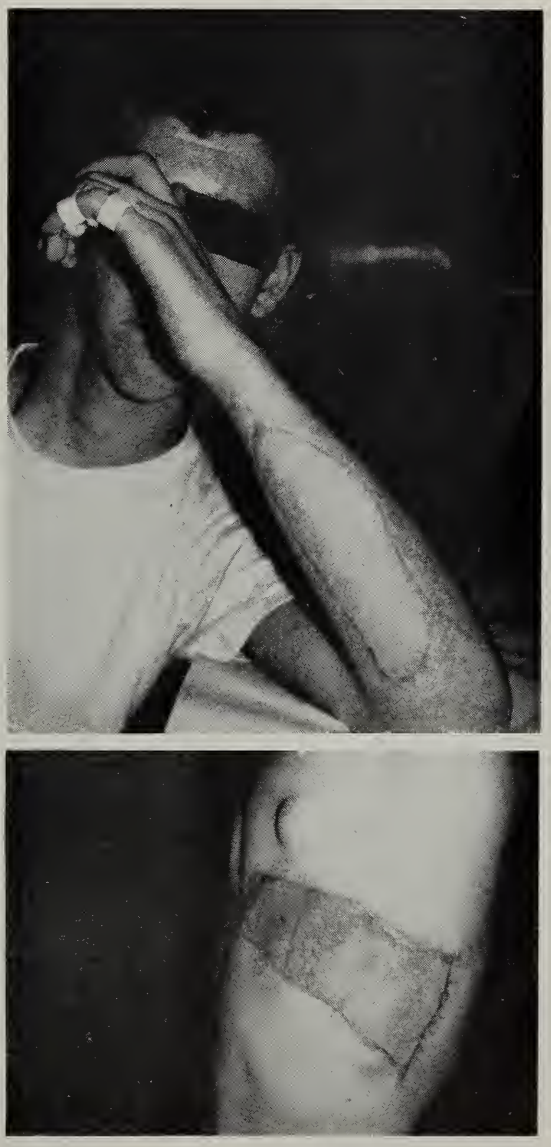


Figure 3.—Showing grafted area on forearm after healing, and pedicle donor site on chest and abdomen as repaired by split skin graft from thigh.

Subclavian Artery Aneurysm Due to Closed Chest Trauma

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THE CASE HERE REPORTED is one of aneurysm in the first portion of the right subclavian artery which was diagnosed six years after the non-penetrating injury to the thoracic cage that apparently caused it.

A 43-year-old Mexican man was admitted to the San Diego County General Hospital on June 14, 1962, for investigation of an intrathoracic lesion first seen on routine survey minifilm in February 1962. A subsequent x-ray film showed a "mass in the right superior mediastinum displacing the trachea to the left."

In an automobile accident in 1956 the patient had received a cerebral concussion, dislocation of the right hip, fracture of the right ankle, and multiple rib fractures of the right lower hemithorax. The latter injury resulted in a flail chest which was treated by external stabilization and tracheostomy. Following discharge from the hospital the patient noted a vague increase in exertional dyspnea after walking a block; this had become more pronounced over the past year. Concomitantly he had slight swelling of the ankles and difficulty in breathing while reclining unless propped on at least two pillows. He has also had occasional vague pain over the right hemithorax unrelated to activity. There was no history of cough, hemoptysis, chills or fever. In the past year and a half the patient had noted infrequent dysphagia, primarily of solid foods.

He was well developed and slightly obese. With the patient recumbent the blood pressure in both

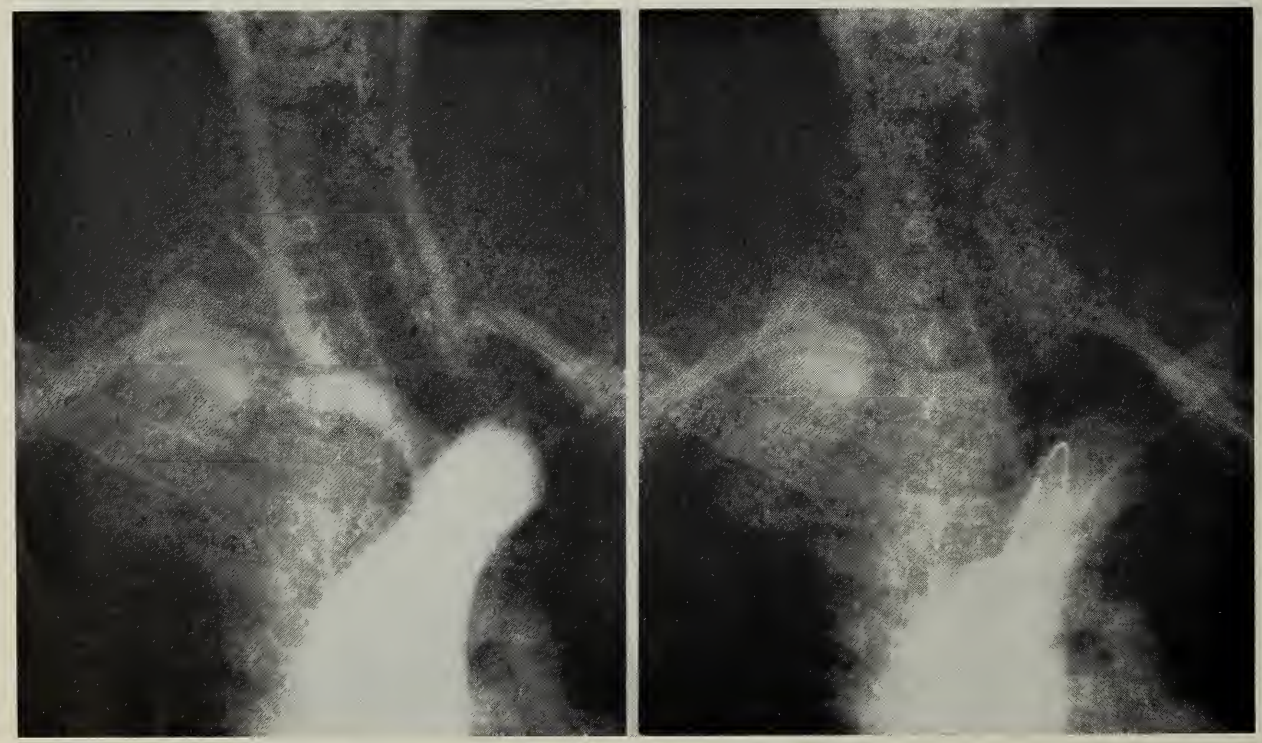


Figure 1.—Retrograde aortogram demonstrating *(left)* the relation of the aneurysm to the innominate artery bifurcation. *Right,* later film in the same series showing the disparity of the true lumen and the size of the mass. Note the pronounced displacement of the trachea and mediastinal structures.

arms was 160/110 mm of mercury and the pulse was 80 and regular and equal bilaterally. There was slight ptosis of the right eyelid apparently secondary to his facial injury, and the right pupil was smaller than the left. Both pupils reacted to light. No abnormality was noted on fundoscopic examination. There was no anhydrosis of the face. Veins of the neck were not distended. The thyroid gland was not palpable and the carotid arteries were equal in size. A faint systolic bruit was heard over the right common carotid artery at the base of the neck, and a similar bruit over the right supraclavicular area. The chest was clear to auscultation and percussion. No neurological deficits were noted and the extremities were intact without evidence of atrophy or edema.

Except for evidence of mild diabetes mellitus, results of laboratory examinations were within normal limits. Because of the superior mediastinal mass, an I^{131} uptake study was done, and the scanogram showed normal configuration of the thyroid gland. Fluoroscopic and radiographic examination of the chest showed a large tumor in the anterior right superior mediastinum with pronounced displacement of the trachea and the esophagus to the left. There was no specific bony erosion or any evidence of pulsation in the tumor. A barium swallow study confirmed the previous findings.

Bronchoscopic examination showed considerable deviation of the trachea to the left with an extrinsic pulsatile area located along the right lateral tracheal wall. The vocal cords were normal, and bronchial washings were negative for malignant cells. A retrograde left common femoral artery arteriogram showed the left common carotid and vertebral arteries to be normal. The innominate artery and the right common carotid artery were well visualized and they also appeared normal. A 6.5 × 4.5 cm aneurysm of the right subclavian artery was seen immediately distal to its take-off from the innominate artery, and the right vertebral artery was faintly visualized (Figure 1). The previously described large, smooth, soft tissue shadow in the upper chest, displacing the trachea, was apparently due to the aneurysm and the laminated thrombus it contained.

At operation a supraclavicular incision was made down the midline, splitting the sternum and along through the third intercostal space. Excellent exposure was obtained (Figure 2).

An aneurysm of the right subclavian artery arose close to the innominate artery bifurcation. It filled almost the entire superior chest, displacing the mediastinum to the left and extending well up into the neck, where it surrounded the brachial plexus. Repair was begun by freeing the innominate, the right carotid, the proximal subclavian and the distal subclavian arteries from the mass and placing clamps

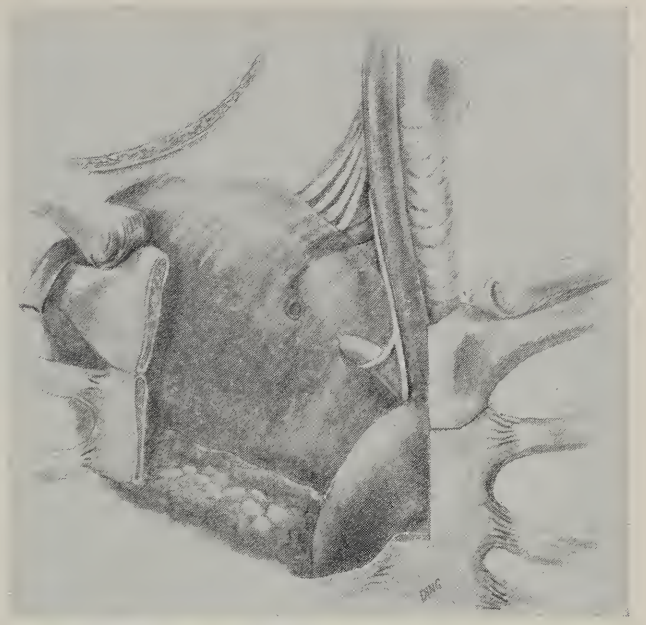


Figure 2.—A semischematic illustration of the surgical exposure in the present case, showing the aneurysm in its relation to the surrounding structures including the vertebral artery, brachial plexus and mediastinum.

on them for control of circulation. The brachial plexus was carefully identified and preserved. To control circulation in the vertebral artery, which appeared to contribute to the arterial supply of the aneurysm, the tumor was opened and the artery was sutured from within. The portion of the aneurysm wall overlying the brachial plexus was left in situ. By proximal and distal anastomosis a preclotted DeBakey graft of 10 mm Dacron® tubing was placed in the subclavian artery. To complete the proximal anastomosis it was necessary to cross-clamp the right common carotid and innominate arteries for a moment. All clamps were then removed and circulation of the upper extremity was restored.

The pathologist's report on the specimen was consistent with either post-traumatic or arteriosclerotic aneurysm. There was no evidence of medionecrosis. In the absence of any other evidence of arteriosclerosis by arteriogram or at the site, and with the excellent clinical history indicating the onset of difficulty coincident with trauma, it appears that the lesion almost certainly was caused by the injury that occurred six years before the operation.

Although erythromycin had been given parenterally immediately before and after operation, major infection of the surgical wound developed on the second day and the patient was febrile. Large amounts of serosanguineous fluid drained from the superior part of the incision. The wound was opened superficially and was copiously irrigated with neomycin sulfate solution. Chloramphenicol, methicillin and penicillin were given by vein.

Cultures of the fluid grew aerobacter aerogenes and escherichia coli, both organisms being sensitive

to the usual antibiotics with the exception of penicillin. Fever abated six days after it began. The infection slowly cleared and the wound was allowed to close by secondary intention. Discharged from hospital on July 20, 1962, the patient had no evidence of residual infection when last examined as an outpatient the following year. Radial pulses were equal, blood pressure was 110/70 mm of mercury in both arms and no abnormalities were seen in an x-ray film of the chest. All the previous symptoms had subsided.

Discussion

Aneurysms of the subclavian artery may involve any of the three parts of the artery. In a survey of the literature, no predilection for any particular segment was noted. The diagnosis may be suspected from symptoms or from abnormalities in an x-ray film. Symptoms produced may be quite varied, depending on the location and size of the lesion—paresthesias or weakness in one upper extremity, a pulsatile mass at the root of the neck, unilateral clubbing or muscle wasting, or diminished pulses and decreased blood pressure in the affected limb. Hoarseness, Horner's syndrome, and vague pain in the chest are occasional presenting complaints. In some cases the lesion is asymptomatic.

Injury as a causative factor may be relatively minor, or it may be severe; and frequently severe injury is associated with fracture of the overlying clavicle. Most of the cases reported, particularly those attributed to war injuries, were secondary to penetrating wound.

The diagnosis of aneurysm is best established by arteriography, although such x-ray clues as calcification at the origin of the subclavian artery or linear calcification along the route of the subclavian artery are helpful. Fluoroscopic examination may not demonstrate pulsations, for frequently these aneurysms are surrounded by laminar clot which does not transmit expansile motion. As it not only can delineate the subclavian artery but also show the extent of involvement of the vital cerebral vessels, arteriography is helpful diagnostically and as a guide to surgical approaches. We have found retrograde femoral arteriography, often used for demonstrating the brachiocephalic vessels for other purposes, to be easily adapted to a problem of this type.

The surgical approach depends somewhat on the size of the lesion and the location. The excellent exposure and good proximal control achieved in the present case by sternal splitting certainly recommends this approach for extensive lesions of this region. Excision and reconstructive operation is now the preferred method of treatment.

Summary

A case report of an aneurysm of the subclavian artery consequent to closed chest trauma is presented. The symptoms were vague and the diagnosis was not made until six years after the injury. Arteriographic delineation was helpful in the diagnosis and in planning operation. Repair was carried out by removal of the aneurysm and the placement of a plastic prosthesis. When wound infection developed, antibiotics were administered locally and systemically, and the infection promptly subsided.

2850 Sixth Avenue, San Diego, California 92103 (Sproul).



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For information on preparation of manuscript, see advertising page 2

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California Medicine

EDITORIAL

Doctors and Drugs

ENCOURAGING PROGRESS has been shown recently in the efforts of the Food and Drug Administration of the Department of Health, Education and Welfare to provide an effective and fair control over drugs released for human consumption.

Most recent advances in this field have been the appointment of a medical director who was until recently a successful practicing internist and the release of a drug which had been withdrawn from the market under FDA orders and now restored for use by physicians in spite of some adverse effects on some patients.

The new medical director of FDA is Doctor Joseph F. Sadusk who until last year was a practicing internist in Oakland and well known to most California physicians for his zealous interest in the field of professional liability exposure and coverage. Doctor Sadusk gave up his Oakland practice to assume a medical school teaching post, from which he has now been drawn into federal service. His long experience in clinical medicine, together with his awareness of the pitfalls accompanying offbeat procedures, make him admirably suited to take on the responsibilities of his present position.

He was the FDA official who reported to the recent American Medical Association meeting on the restoration to the market of an anti-depressant drug which had been withdrawn because of its side effects, including several deaths, on some patients. The restoration was based on the efficacy of the drug, which was adjudged to outweigh the risks inherent in its use on a limited number of patients.

This episode was accompanied by a requirement that more stringent instructions must accompany the drug in the original package insert. These inserts, generally printed in small type and wedged into containers, may be overlooked by the prescribing physician but are of vital importance in the case of new and potent drugs.

The late Senator Kefauver carried on a relentless campaign to provide strict federal control over all drugs, new and old alike. His campaign led to the adoption of the current laws, which call on the Food and Drug Administration to certify not only to the safety of a drug but also as to its efficacy.

Needless to say, these restrictions have caused a furore among pharmaceutical producers, who have opposed the additional requirements demanded on many drug items which have been in widespread use for years and which are considered to be so well known to all physicians as not to require the preparation and distribution of "textbook" directions. The pharmaceutical houses have also decried the absence of appeal bodies to which they could take their cases in the event of FDA decisions they considered ill-advised or unfair.

Behind this controversy lies a long-standing conflict of opinion between the liberals and the conservatives in the field of drug production and distribution. This conflict involves also the publishers of medical publications and their advertising policies.

On the conservative side of the question are those who believe that every physician must be schooled in the use of any new and potent drug and that such schooling must be undertaken from the very beginning with every new drug product.

The liberals, on the other hand, express confidence in the basic training and knowledge of the practicing physician and ask only that he use his head and his training before using a new drug. They ask also that he familiarize himself with the literature, including package inserts, and that he be aware of contraindications and side effects.

Today's physician probably falls somewhere between these points of view. He is well-trained, he is capable of assimilating more and newer knowledge and he is basically interested in the best care for

his patients. At the same time, he may be a member of a minute percentage of the total who will grasp at straws in cases which have eluded his successful treatment under older drug items.

The thalidomide and chloramphenicol situations have drawn considerable interest in recent years. One has been denied access to the American market and the other has been placed under strict regulation as to information and promotion. Paradoxically, thalidomide was never cleared for distribution in this country but its side effects, when used for purposes not originally contemplated, were sufficiently convincing to bring about the enactment of the new federal statutes.

It is natural that any new laws which carry restrictive provisions will be opposed by those whom they affect, even though such opposition may be on minute technical grounds. Regulations written to implement the law may be drawn too tight and may impose requirements which are oppressive and without the prospect of benefit to anyone. At the same time, free-wheeling in drug production and marketing must be restricted in the interests of the consuming public.

The Food and Drug Administration has apparently taken steps to resolve the areas of conflict which immediately came into being with the new law and its regulations. The appointment of a medical director so recently immersed in clinical practice proves that this post is not being farmed out to the ivory tower. The restoration of a drug to the market in the light of its usefulness outweighing its dangers is another step that indicates a sound basis as prevalent in the department.

To Joe Sadusk in his new and exceptionally important post, the medical profession throughout the country, and in California in particular, offers its best wishes for a most successful and meaningful career. His choice for this vital position is eminently suitable.

A New Dean At USC

To ANYONE facing the trying task of finding a suitable replacement for an able and valuable executive officer who has resigned, it must be gratifying indeed to announce appointment of a successor who seems splendidly equipped by training and by personal aspect to carry on with the success his predecessor knew.

We can assume that Dr. Norman Topping, president of the University of Southern California, felt gratification in that circumstance when he named Dr. Roger O. Egeberg to the deanship of the USC School of Medicine to replace Dr. Clayton G. Loosli who had resigned to become medical director of the Hastings Foundation, an affiliate of the school.

We believe Dr. Loosli will carry success with him to his new job. We as strongly believe that the personality and the experience in private practice, in research, in medical administration and in public service (see page 147) that Dr. Egeberg brings with him to the deanship make him a happy choice for head of the faculty at USC School of Medicine.



AMPAC Should Be in Your Vocabulary

WITNESS NOW THE SEASON for banner-waving and speech-making. Another election year faces us, an occasion when candidates and political parties and partisans mobilize to secure your vote and mine.

Although any election year may be exciting to many, an exercise in frivolity to others, still you and I must be reminded frequently that the selection of governmental representatives eventually affects our way of life and living. It is, to say the least, serious business.

I have been impressed over the years with the increasing number of physicians, their wives and associates who have taken an intense interest in the revolution and evolution of representative government in California and the nation. We physicians have been continually admonished to devote attention to our "civic" lives as well as our professional responsibilities. I salute those of you who have recognized the necessity for becoming involved in the political process; I urge the rest of you to join hands with your colleagues in the public decisions which so vitally affect all of us.

Medicine has an unusual role to play in this arena of public affairs. We deal in matters of life and death. And like it or not, large numbers of decisions are being made in legislative chambers which influence the quality, availability and cost of health care to the American people. We must take a more active part in these decisions.

The vehicle most of us in medicine have chosen is AMPAC—the American Medical Political Action Committee. In addition to the Public Health League which serves us well on the state scene, AMPAC functions in the national arena—supporting candidates for federal office.

Still in its organizational infancy, AMPAC continues to prove the value of medicine's joining in the great political decisions facing voters and representatives across the country. I have been impressed with its early successes, understanding of its growing pains, and I remain convinced that it will be an effective instrument for our collective action in the future.

You may ask "why?" Why organize a federal political action committee for medicine and its paramedical allies?

- For the preservation of freedom in medical practice which we sincerely believe to be in the best interests of the patients we serve.
- For collective action, for our viewpoint and support are stronger when we join together for a mutual goal.
- For clarity of understanding among governmental representatives and other groups as to the aggressive role medicine will play in the arena of public affairs.

We must continue to seek out and support candidates for federal office, particularly candidates for the United States House of Representatives, who understand the complex problems of modern medical care. And our support must be meaningful—in the terms of time, hard work and, most important, hard cash.

The congressional candidate may be Democrat or Republican, incumbent or not—but in order to get AMPAC support he must be the type of representative medicine can talk to, work with and learn from.

As all of us know, during this year of 1964, congressional elections will be held in all of California's 38 districts. Men will be selected to represent our patients and ourselves during the next two years in Washington. What we do today, tomorrow and every day through the November decision may determine the future course of American medicine. Will you join with me in supporting AMPAC—with time, hard work and hard cash? A good first step would be to send your contributions today to: California Volunteers for AMPAC, Suite 823-A, 1515 North Vermont, Los Angeles.

And I would urge you to place AMPAC in your vocabulary—talk to your colleagues and friends about the continuing efforts of medicine to become involved in the vital political questions of the day.

James C. Doyle

California Medical Association

NOTICES AND REPORTS

Council Meeting Minutes

Tentative Draft: Minutes of the 502nd Meeting of the Council, Los Angeles, Airport Marina Hotel, June 13, 1964

The meeting was called to order by Chairman Anderson in the Airport Marina Hotel, Los Angeles International Airport, on Saturday, June 13, 1964, at the hour of 9:30 a.m.

Roll Call

Present were President Doyle, President elect Teall, Secretary Hosmer, Editor D. L. Wilbur, Vice Speaker Telford and Councilors MacLaggan, Wilson, Todd, Gooel, Taw, Bullock, O'Connor, Ham, Rogers, Maguire, Murray, Miller, Watts, Kaiser, Anderson, Dozier, Cosentino, Grunigen and Shaw.

Absent for cause, Speaker Quinn, Councilors R. S. Wilbur, Fenlon and Kay.

A quorum present and acting.

Present by invitation were Messrs. Hunton, Thomas, Clancy, Collins, Marvin, Whelan, Klutch, Clark, Edwards, Bowman, James, Moreillon, and Mrs. Redfern of CMA staff; Messrs. Hassard and Huber of legal counsel; Messrs. Read, Salisbury, Putnam and Brown of the Public Health League; county executives Rideout of Butte-Glenn, Addington of Forty First, Baker of Los Angeles, Blankfort of Marin, Colvin of Monterey, Bannister of Orange, Donmyer of San Bernardino, Nute of San Diego, Neick of San Francisco, Thompson of San Joaquin, Brown and York of Sonoma, Whitehall of Stanislaus, Bruce of Tulare; Robert Garrick, consultant; Messrs. Paolini, Bentley, Potloff, O'Dea and Doctors T. Eric Reynolds and Paul I. Hoagland of California Physicians' Service; John Pompelli of the AMA; Richard Layton of AMPAC; Clifton Linville of California Hospital Association; and Doctors Dan O. Kilroy, Osman Hull, Francis E. West; Mr. Paul Ward, Administrator of the State Health and Welfare Agency; Doctor Lester McDonald and Mrs. Eunice Evans of the State Department of Social Welfare, and others.

The Chairman reported on the death on May 12, 1964, of Mr. William Tobitt, a staff member, and announced that the meeting would convene in his honor and would adjourn in his memory. Adjournment would also be in the memory of Doctor Lowell Rantz, an active participant for many years in continuing medical education activities.

The chairman introduced Mr. Paul Ward, Administrator of the Health and Welfare Agency of the State of California, and welcomed him to the meeting.

1. *Minutes for Approval*

Minutes of the 501st Meeting of the Council, held May 2, 1964, were presented and the following corrections made in the copies previously distributed:

1. Item 10, Resolution No. 15-64: Add language at end of item so that the final line shall read "... of intent of a resolution proposed for AMA House of Delegates."

2. Item 12, line 4: Correct name of agency to read "Federal Department of Health, Education and Welfare."

JAMES C. DOYLE, M.D. President
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WILLIAM F. QUINN, M.D. Speaker
JOSEPH W. TELFORD, M.D. Vice-Speaker
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3. Item 22, paragraph in announcement of 1965 Annual Session theme: delete final two words ("if desired").

4. Item 23(j): Delete language and substitute the following: "Request for study by Bureau of Research and Planning in cooperation with Los Angeles County Medical Association and Board of Medical Examiners to ascertain characteristics of physicians who are not members of medical societies. The pilot study would be conducted in Los Angeles County. The objective of the study is to determine reasons for non-membership as determined by (1) characteristics of practice and (2) attitudes and beliefs of physicians. Cost estimated at about $2,500, to come from the Bureau's budget. Voted to refer to the Bureau of Research and Planning."

ACTION: Minutes as distributed and as amended, above, approved.

2. *Membership*

(a) Report of membership as of June 10, 1964, presented and ordered filed.

(b) Reinstatement of 1,120 delinquent members, dues now paid, voted.

(c) Applications of 8 for election to Associate Membership voted. These were: William A. Burke, Bishop Clemson Marsh, A. Ragnar Stadin, Los Angeles County; Albert Rotella, Orange County; Verna Lucille Robson, Sacramento County; Leon J. Numainville, San Bernardino County; C. Peter Rosenbaum, Santa Clara County; Victor Lee Kovner, Forty First.

(d) Applications of five members for election to Retired Membership voted. These were: Willard H. Newman, San Diego County; Margaret H. Reese, San Francisco; Clara Gans, San Mateo County; David B. Rosehill, Santa Clara County; George T. Burke, Ventura County.

(e) Applications for reduction of dues for 17 members, for reasons of prolonged illness or postgraduate study voted.

3. *Unfinished Business*

(a) A list of resolutions adopted by the 1964 House of Delegates was presented, together with staff recommendations of appropriate commissions or committees to handle on referral, was presented and voted approval.

(b) The chairman requested the Council approve a proposal to establish at the time of each Annual Session, several temporary review committees composed of Council and staff members to study the decisions of the House of Delegates and to report to the Council with recommendations for Council action.

ACTION: Voted referral to Committee on Committees for study and report.

(c) Revisions in the procedural rules governing the meetings of the Council and Commissions and Committees was presented and subjected to discussion. Several amendments were presented and voted.

ACTION: Procedural rules, as revised and as amended, voted.

4. *Audio-Digest Foundation*

The chairman requested approval of a committee of three members of the Council to meet with representatives of the Board of Directors of Audio-Digest Foundation, to discuss the disbursement of excess operating funds of the latter.

ACTION: Approval voted. The chairman named Councilor Murray as chairman and Councilors Miller and Telford as members.

5. *Report of the President*

President Doyle discussed the coordinated home care program proposed in the light of increasing hospital costs. He stated that such a program was already being formed by two hospitals in Los Angeles and that such programs could be organized under medical supervision either through hospitals or community agencies.

ACTION: Voted to refer subject to Commission on Community Health Services for study and report back to Council.

Doctor Doyle also requested that the Association serve as co-sponsor, without financial obligation, for a Southern California Sports Symposium scheduled to be held July 19, with numerous organizations listed as sponsors.

ACTION: Co-sponsorship voted approval.

Doctor Doyle reported on several meetings he has recently attended, including one with California Farm Bureau Federation representatives on the subject of pesticides, a meeting of the Northern California Hospital Council and the annual meeting of the California Medical Assistants' Association.

6. *Committee on Legislation*

Doctor Dan O. Kilroy, chairman of the Committee on Legislation, reported on the recently concluded session of the State Legislature, including the following items:

(a) Assembly Bills 91 and 92, relating to establishment of mental retardation centers and providing for enlargement of the Hospital Advisory Committee to the State Department of Public Health, to add members oriented in the field of mental health, were adopted and are now law.

(b) Funds for establishment of two respiratory disease centers, opposed by the Association, were not included in the budget adopted.

(c) A proposal for new legislation to make mandatory phenylketonuria testing of newborns a mat-

ter of law was presented to Doctor Kilroy, who responded that in his opinion such mandatory requirements should not be frozen into law but should be met by educational processes, aided, if necessary, by public health regulations.

ACTION: Doctor Kilroy's attitude approved by Council.

(d) A new state Mental Retardation Committee of 16 members is to be appointed, the members representing various segments of the population and of state agencies, and the Association has been asked to nominate a member to represent the Association. Doctor Kilroy asked authority to confer with the chairman of the Committee on Mental Health for assistance in selecting an appropriate representative.

ACTION: Requested authority voted.

7. *State Health and Welfare Agency*

Mr. Paul Ward, Administrator of the State Health and Welfare Agency, expressed his thanks for an invitation to attend Council meetings and stated his desire to work in cooperation with the Association. This agency comprises the state departments of public health, social welfare, mental hygiene and rehabilitation.

8. *State Department of Social Welfare*

Mrs. Eunice Evans, deputy director, commented on the coordinated home care program previously discussed by Doctor Doyle and stated that the department will pay costs of such care where essential services are provided on a physician-based service through hospitals or community agencies.

Mrs. Evans also reported that the department was desirous of transferring the provision of hearing aids to welfare patients to the medical program. She also commented on chronic disease workshops recently held in conjunction with the American Cancer Society and other agencies and expressed the hope that component medical societies may cooperate in an effort to orient social work supervisors in their own areas to the problems encountered in dealing with the various conditions encountered.

Mrs. Evans further reported that the Department of Social Welfare had cooperated with the Department of Mental Hygiene in providing public assistance support for mental health patients who are returned to their own homes.

9. *California Hospital Association*

Mr. Clifton Linville, CHA president, referred to the earlier reported proposal to make phenylketonuria testing of newborns mandatory and stated that many hospitals already follow such a practice. He stated his opinion that neither legislation nor public health regulations were needed in this area.

10. *California Physicians' Service*

Doctor Paul Hoagland, board chairman of CPS, reported that a question has arisen as to the advisability of paying physicians for services provided by them to members of their own families.

ACTION: Voted to refer this to the Judicial Commission for review.

Doctor Hoagland also reported on proposals advanced by the head of a large group practice clinic for establishment of a statewide foundation for the provision of medical services through group practice groups. The proposal was made at a conference sponsored by the Department of Industrial Relations of University of California. CPS representatives have prepared a memorandum on this topic and copies will be forwarded to members of the Council and to society executive secretaries.

Doctor Hoagland also discussed various methods of achieving a system of advance payment for after-retirement medical care benefits as outlined in Resolution No. 15-64 adopted by the House of Delegates. An initial program developed by CPS would provide after-retirement benefits on the same basis as those delivered during the working years of the covered employees, with the employee to pay the difference in cost.

ACTION: Above initial program and subsequent proposals voted to be referred to the Finance Committee for study and recommendation.

11. *Medical Executives Conference*

Mr. Everett Bannister, chairman, reported on the meeting of the Medical Executives Conference on June 12 and introduced several new component society executives, including Al Whitehall of Stanislaus County, Mrs. Lora Bruce of Tulare County and Jack Addington of Forty First Medical Society. He asked approval of Mr. Addington for appointment as a member of the conference, while Mr. Whitehall and Mrs. Bruce are being considered by a membership committee.

ACTION: Mr. Jack Addington voted membership in the Medical Executives Conference.

12. *American Medical Association*

Mr. John Pompelli, field representative of the AMA, reviewed the congressional situation of HR 3920, the King-Anderson Bill, and reported that Chairman Wilbur Mills of the House Ways and Means Committee, remained unalterably opposed to using the Social Security mechanism for providing medical or hospital services for the aging. It is more to be anticipated, he said, that additional cash allowances for OASI recipients and an expanded program under the existing Kerr-Mills legislation will be reported out by the committee.

13. *Staff Report*

Mr. Hassard commented on the untimely death of William C. Tobitt, a member of the communica-

tions staff. He also introduced to the Council Mr. Don James, who will work as staff coordinator with commissions and committees, and Mrs. Donna Redfern and Mr. Stanley Moreillon, both employed by the communications department.

14. *Report of President Elect*

Doctor Teall reported on a meeting with officials of the State Department of Social Welfare, at which podiatrists' fees were under discussion, and on several component society meetings he had recently attended as a guest.

15. *Committee on Committees*

Doctor Teall, chairman of the Committee on Committees, presented a series of nominations for commission or committee appointments, all of which were approved.

16. *Editorial Board*

Doctor D. L. Wilbur, Editor, presented a list of nominees for appointment as members of the Editorial Board under five-year terms of office.

ACTION: Nominees presented approved for appointment.

Doctor Wilbur also presented several proposals for changes in the format of CALIFORNIA MEDICINE, including a new design for the front cover, a new paper stock and a change in the type face designed to make reading easier. He noted the desirability of making changes, if approved, with the start of a new volume (July or January) and pointed out that increased production costs would be involved if the new paper stock and type face were to be used.

ACTION: Refer proposed changes to Finance Committee for consideration of extra costs beyond approved budget items.

17. *Bureau of Research and Planning*

Doctor Samuel R. Sherman reported on recent meetings of the Bureau of Research and Planning and reviewed some of the studies now under way in the bureau. He referred to Resolutions 75-64 and 77-64 adopted by the House of Delegates and pointed to both the studies already under way and possible ill side effects if definite action were taken on these resolutions at this time. He recommended no action on these resolutions.

ACTION: Voted no action to be taken on Resolutions 75-64 and 77-64 at this time.

Doctor Sherman also recommended that the program of the next conference of component society officers devote considerable attention to the quality of medical care and the methods used in various counties for determining this quality.

ACTION: Voted that this subject be referred without recommendation to the ad hoc committee to establish the agenda of the next component society officers' conference.

The bureau, Dr. Sherman reported, had approved the proposal for a study of the characteristics of physicians who are not members of component societies and asked Council approval of the Bureau's entering into this study.

ACTION: Study of the characteristics of non-society member physicians in Los Angeles County, in cooperation with the Los Angeles County Medical Association and the State Board of Medical Examiners voted approval.

Doctor Teall reported that an invitation had been received for the Association to be represented at a meeting of a new organization on group practice, to be held in Disneyland in August. He requested authority to attend.

ACTION: Authority voted for Doctor Teall to attend meeting of organization on group practice.

18. *Medical Staff Survey Committee*

Doctor MacLaggan, chairman of the Medical Staff Survey Committee, reported that surveys had been planned in the Orange and Santa Barbara County areas in July.

19. *Commission on Medical Services*

Doctor Murray, chairman of the Commission on Medical Services, reported that the revised edition of the Relative Value Studies under preparation by the Committee on Fees was rapidly nearing completion and that it is hoped to have the new edition ready to present to the Council for approval at the next meeting.

20. *Scientific Board*

Doctor Shaw, chairman of the Scientific Board, presented a statement on smoking prepared by the Committee on Scientific Information and requested that the Council approve it for distribution or take such action as was deemed appropriate.

ACTION: Statement referred back to Scientific Board for further study and later report.

21. *Bureau on Communications*

Mr. Frank Clark, director of the bureau, gave a progress report on items considered by the bureau at its May 13 meeting and expressed thanks for the suggestions made by a number of component society executives in subsequent meetings. He reported that items referred to the bureau following House of Delegates actions were under active consideration.

Mr. Hassard, in behalf of the bureau, asked authorization to retain outside consultants, within the bureau's budget, to assist in program planning functions.

ACTION: Authority to retain outside consultants voted.

22. *Hospital Staff Provisions*

Doctor Telford reported that regulations proposed by the administration of a hospital under construction in the San Francisco area would apparently limit surgical and obstetrical privileges to board certified members of the staff. He asked that the Council reaffirm its earlier position, to the effect that hospital staff privileges should be based on demonstrated ability and training.

ACTION: Council voted to reaffirm its earlier position.

23. *State Employees Retirement System*

Doctor Watts, chairman of the Medical and Hospital Advisory Committee to the State Employees' Retirement System, reported that the committee had submitted to the administrative board of the system a report on members' attitudes on the several forms of health care insurance open to members. He urged that members of the Council become familiar with this report and staff was requested to secure copies for members of the Council and component society executives.

24. *Disability Insurance*

Doctor Cosentino reported that some 250 members of the Forty First Medical Society would be subject to higher premium costs on a disability group insurance coverage if new sponsorship of the program were not secured before dissolution of the society.

ACTION: Referred to Committee on Insurance.

25. *American Medical Political Action Committee*

Doctor Todd, chairman of the California Volunteers for AMPAC, reiterated a plea for personal and financial interest in the coming elections, and Mr. Richard Layton of AMPAC displayed a film encouraging physicians to take an active interest in the political arena.

26. *Time and Place of Next Meeting*

The chairman announced that the next meeting would be held in San Francisco on August 8, 1964.

Adjournment

There being no further business to come before it, the meeting was adjourned at 4:15 p.m. in the memory of Doctor Lowell Rantz and Mr. William C. Tobitt.

CARL E. ANDERSON, M.D., *Chairman*
MATTHEW N. HOSMER, M.D., *Secretary*

In Memoriam

ALLEN, PHILIP KING, San Diego. Died June 14, 1964, aged 63. Graduate of Washington University School of Medicine, St. Louis, Missouri, 1927. Licensed in California in 1930. Doctor Allen was a member of the San Diego County Medical Society.

✤

BERG, GEORGE OSCAR, Hollywood. Died July 6, 1964, in Hollywood, aged 72, of heart disease. Graduate of the University of Wisconsin Medical School, Madison, 1928. Licensed in California in 1929. Doctor Berg was a member of the Los Angeles County Medical Association.

✤

BERNSTEIN, MAURICE A., Beverly Hills. Died July 2, 1964, in Los Angeles, aged 80. Graduate of Northwestern University Medical School, Chicago, Illinois, 1908. Licensed in California in 1940. Doctor Bernstein was a member of the Los Angeles County Medical Association.

✤

COHEN, AARON A., Los Angeles. Died June 11, 1964, in Van Nuys, aged 49, of metastatic carcinoma. Graduate of Johns Hopkins University School of Medicine, Baltimore, Maryland, 1939. Licensed in California in 1941. Doctor Cohen was an associate member of the Los Angeles County Medical Association.

✤

CRANE, WALTER R., Los Angeles. Died July 4, 1964, in Los Angeles, aged 80, of carcinomatosis. Graduate of Columbia University College of Physicians and Surgeons, New York, New York, 1912. Licensed in California in 1914. Doctor Crane was a retired member of the Los Angeles County Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✤

DAVIS, HENRY J., Sacramento. Died June 23, 1964, in Sacramento, aged 81. Graduate of the University of Pittsburgh School of Medicine, Pennsylvania, 1911. Licensed in California in 1913. Doctor Davis was a member of the Sacramento Society for Medical Improvement.

✤

DIGNAN, HOWARD HENRY, San Francisco. Died June 26, 1964, in San Francisco, aged 76. Graduate of Johns Hopkins University School of Medicine, Baltimore, Maryland, 1913. Licensed in California in 1915. Doctor Dignan was a retired member of the San Francisco Medical Society and the California Medical Association, and an associate member of the American Medical Association.

✤

FROST, GARRISON ALBERT, Bell. Died June 13, 1964, in Lynwood, aged 59, of a coronary. Graduate of Creighton University School of Medicine, Omaha, Nebraska, 1932. Licensed in California in 1932. Doctor Frost was a member of the Los Angeles County Medical Association.

GARRETSON, KIRK D., Mill Valley. Died July 11, 1964, in Novato, aged 48, of heart disease. Graduate of Washington University School of Medicine, St. Louis, Missouri, 1941. Licensed in California in 1942. Doctor Garretson was a member of the Marin Medical Society.

✤

GOGOL, LOUIS JACOB, Los Angeles. Died June 15, 1964, in Los Angeles, aged 58, of heart disease. Graduate of the University of Illinois College of Medicine, Chicago, 1931. Licensed in California in 1933. Doctor Gogol was a member of the Los Angeles County Medical Association.

✤

GUNTHER, LEWIS, Los Angeles. Died June 30, 1964, in Los Angeles, aged 63, of carcinoma of kidneys. Graduate of Yale University School of Medicine, New Haven, Connecticut, 1926. Licensed in California in 1927. Doctor Gunther was a member of the Los Angeles County Medical Association.

✤

HOKENSON, JOHN C. (CALVIN), La Habra. Died July 9, 1964, in an airplane crash on the Camp Pendleton Marine Reservation, aged 39. Graduate of Marquette University School of Medicine, Milwaukee, Wisconsin, 1953. Licensed in California in 1954. Doctor Hokenson was a member of the Los Angeles County Medical Association.

✤

HUDSPETH, WILLIAM T., Riverside. Died May 16, 1964, aged 48. Graduate of Cornell University Medical College, New York, New York, 1942. Licensed in California in 1954. Doctor Hudspeth was a member of the Riverside County Medical Association.

✤

KOOPERMAN, MYER, Sherman Oaks. Died June 25, 1964, in Encino, aged 52, of cerebral hemorrhage. Graduate of Loyola University School of Medicine, Chicago, Illinois, 1938. Licensed in California in 1948. Doctor Kooperman was a member of the Los Angeles County Medical Association.

✤

ORME, RICHARD E., San Francisco. Died January 24, 1964, aged 63. Graduate of the University of California School of Medicine, Berkeley-San Francisco, 1929. Licensed in California in 1929. Doctor Orme was a member of the San Francisco Medical Society.

PEERY, LESLIE TRUSTEN, Hayward. Died June 22, 1964, in Hayward, aged 65, of cardiac failure. Graduate of the University of Oregon Medical School, Portland, 1925. Licensed in California in 1925. Doctor Peery was a retired member of the Alameda-Contra Costa Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✤

SMITH, DAVID WALTER, La Mirada. Died July 9, 1964, in an airplane crash on the Camp Pendleton Marine Reservation, aged 33. Graduate of Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, North Carolina, 1957. Licensed in California in 1959. Doctor Smith was a member of the Los Angeles County Medical Association.

✤

SMITH, GERALD F., Hermosa Beach. Died June 28, 1964, aged 70, of arteriosclerotic cardiovascular disease. Graduate of the College of Physicians and Surgeons, Los Angeles, 1919. Licensed in California in 1920. Doctor Smith was a retired member of the Los Angeles County Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✤

TAUB, BERTRAM, Los Angeles. Died July 3, 1964, in Los Angeles, aged 50, of an acute coronary. Graduate of New York University College of Medicine, New York, 1938. Licensed in California in 1947. Doctor Taub was an associate member of the Los Angeles County Medical Association.

✤

VON GELDERN, HANS, San Francisco. Died June 27, 1964, in Los Gatos, aged 70. Graduate of Stanford University School of Medicine, Palo Alto-San Francisco, 1920. Licensed in California in 1920. Doctor von Geldern was a member of the San Francisco Medical Society.

✤

WILLIAMS, HARRY DENELL, San Francisco. Died July 2, 1964, in San Francisco, aged 56. Graduate of Creighton University School of Medicine, Omaha, Nebraska, 1934. Licensed in California in 1934. Doctor Williams was a member of the San Francisco Medical Society.



PUBLIC HEALTH REPORT

MALCOLM H. MERRILL, M.D., M.P.H.
Director, State Department of Public Health

THE REGULAR BIENNIAL RENEWAL of all radiation source registrations is scheduled for this month, as provided for by the California Radiation Control Regulations.

Since 1960, all users of radiation machines, and certain radioactive material users have been required to register with the department. The registration requirement now in effect covers radiographic, fluoroscopic and therapeutic x-ray equipment used by physicians and surgeons, among others of the healing arts.

As of March, 1964, there were 13,225 registered radiation source possessors, reporting 20,060 radiation machines. Of these, 7,191 were used for medical radiography and 3,019 for medical fluoroscopy. There were 771 medical therapy units.

* * *

Routine testing of food samples collected from hospitals in every area in California has become part of the health department's radiological surveillance program.

The food sampling program, coupled with air, water and rain surveillance, will provide comprehensive measurement of human exposure from environmental radioactivity.

It was decided to obtain information on radioactive contamination of food consumed by people as representing the best index of public health concern with environmental radioactivity. The "house" diets of hospitals was selected because at least one hospital exists in each area of interest, they are in operation every day, and a hospital diet is considered to represent a reasonable cross-section of food consumed in its community.

It is recognized that wide variations exist in dietary habits and that there is no really typical diet. Nevertheless, the plan chosen is believed to be a reasonable one from the standpoint of determining overall population exposure from environmental radioactivity.

Once every two months each hospital which agreed to cooperate sets aside a standard portion of each of 21 consecutive meals. These are frozen and shipped to the department's radiological laboratory to be analyzed. The results are reported in picocuries of Strontium 90, Cesium 137, and Radium 226.

* * *

After ten years of drinking fluoridated water, children in Antioch, Contra Costa County, have been found to have a significant reduction in the incidence of dental decay.

One aspect of a study conducted by the county health department, which involved inspecting the primary teeth of five-year-old children, disclosed that the experience as to three factors—decayed, extraction indicated, and filled—among children examined in 1962 was 55 per cent lower than it had been in 1952. Further, 53 per cent of those studied in 1962 were found to be caries-free, as compared with 23 per cent in 1952.

In examining permanent teeth, the investigators found a reduction of 84 per cent in the decayed-missing-filled experience among six-year-old children between 1952 and 1962. Significant, although somewhat less reduction was noted in older children. Even among 16-year-olds there was found to be a 30 per cent reduction in decayed, missing and filled teeth after ten years of fluoridation.

CALIFORNIA MEDICAL ASSOCIATION

1965 Annual Scientific Assembly

Fairmont and Mark Hopkins Hotels, San Francisco, March 28-31, 1965

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SECRETARIES OF THE SCIENTIFIC SECTIONS

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2040 Forest Avenue, San Jose 95128

ANESTHESIOLOGY Thomas W. McIntosh, M.D.
686 East Union Street, Pasadena 91101

DERMATOLOGY AND SYPHILOLOGY Charles G. Steffen, M.D.
250 West Badillo, Covina 91722

EAR, NOSE AND THROAT G. Howard Gottschalk, M.D.
8618 Sepulveda Boulevard, Los Angeles 90045

EYE Richard Kratz, M.D.
15225 Van Owen, Van Nuys 91405

GENERAL PRACTICE J. Blair Pace, M.D.
408 Cassidy Street, Oceanside 92054

GENERAL SURGERY T. Newlin Hastings, M.D.
1136 West 6th, Los Angeles 90019

INDUSTRIAL MEDICINE AND SURGERY Leon R. Rudnic, M.D.
15921 East 14th Street, San Leandro 94578

INTERNAL MEDICINE Robert L. Paver, M.D.
384 Post Street, San Francisco 94108

OBSTETRICS AND GYNECOLOGY Lester T. Hibbard, M.D.
1930 Wilshire Boulevard, Room 607, Los Angeles 90057

ORTHOPEDICS David C. Monsen, M.D.
2300 South Hope Street, Los Angeles 90007

PATHOLOGY AND BACTERIOLOGY Donald L. Alcott, M.D.
Santa Clara County Hospital, South Bascom Avenue, San Jose 95128

PEDIATRICS Richard L. Anderson, M.D.
636 Harris Street, Eureka 95501

PHYSICAL MEDICINE Rene Cailliet, M.D.
4900 Sunset Boulevard, Los Angeles 90027

PREVENTIVE MEDICINE AND PUBLIC HEALTH Henrik L. Blum, M.D.
P.O. Box 871, Martinez 94554

PSYCHIATRY AND NEUROLOGY Stanley A. Skillicorn, M.D.
700 Medico-Dental Building, San Jose 95113

RADIOLOGY Victor G. Mikity, M.D.
1200 North State Street, Los Angeles 90033

UROLOGY Carl K. Pearlman, M.D.
1518 North Sycamore, Santa Ana 92701

Programing for the Auxiliary

THE AUXILIARY bases its year's programing on the aims and goals of the medical association. We correlate very closely with the work of our parent organization. This, along with the program ideas from the National Auxiliary, comprises the outline for the year.

The lighter side is introduced at social functions—bridge parties, style shows, teas, but even this contributes indirectly to the more serious ideals of the Auxiliary in an indirect way. Such functions develop an atmosphere of friendly cordiality. A well-acquainted, friendly group insures successful programs and is more conducive to cooperative effort and interest.

Educating our own membership should be the underlying motive for all program plans. Although legislation is our prime target and should receive the greatest emphasis, we do owe a more immediate responsibility to our community. Awareness of its needs and accomplishments should be as vital to us as is the progress and the protection of the best in medicine. We have an obligation to keep abreast of the history and attainments of our local communities.

Accentuating what medicine has done in public health, space exploration and public safety, to mention a few fields of interest, should have a place on every county auxiliary's program outline. We all know what we oppose, but, to be informed doctors' wives, we need a positive position to present. Although the medical profession's work toward promoting better health through research far exceeds whatever effort it expends in opposition to legislation it considers harmful, the profession has been labeled as always being "against everything." We, ourselves, are partially responsible for permitting this misconception to continue if we neglect to arm ourselves with facts and figures to demonstrate medicine's major contributions to modern living. Before we attempt to defend medicine, we must be well informed. Part of our program is directed toward this end.

As we are an auxiliary body, all our programs should reflect the ideals of the medical association on national, state and local levels.

MRS. ROBERT J. DOUDS
Program chairman

Doctors and Politics

SO YOU WANT to do scientific medicine and be let alone! So you think the preoccupation with socio-economics (yes, and *politics*) is not the proper function of a medical organization or its woman's auxiliary. Well, if this shoe fits, you probably won't read on anyway—but I can't be shot for trying.

It is hard to believe that you really want to become a sort of technician working for, or at least under the direction of, a government agency. This could happen if some of the social planners are successful in schemes to draw you into the statist complex through Social Security, through Federal Aid to Education, through the National Institutes of Health, through the Veterans Administration control of hospitals and education and the like.

We have done pretty well for free enterprise by being the little boy with his finger in the dike. We have staved off outright federal and state panel medicine for nearly 30 years, and at the same time have had an unequaled *positive* record in standing legislatively for what is good for your patients. Yes, medicine's record is a *positive* record. However, we have a never-ending job to do.

1. *Elect our friends*

This, of course, starts with the primaries in our state. Your respective medical societies must have individual members assigned to contact each candidate running for office in an attempt to find out how he "stands" relative to medicine and federal intervention. Then information as to each candidate's

stand must be disseminated throughout the membership before election. If a candidate is an incumbent, our Public Health League knows his voting record and will readily supply such information. You may rest assured the League is a vigilant watchdog.

Where federal legislation is concerned, we must rely on "friendly" congressmen. This is where we must depend on the work of AMPAC (the American Medical Political Action Committee) and your generous dollars to support the proper campaigns. It is known to all of you that neither the CMA nor the AMA is organized to function in the field of federal politics; thus the necessity for our state political arm, the Public Health League, and our national political committee, AMPAC. In some areas of our state we are reasonably assured of the election of congressmen friendly to our beliefs, while in others there is need for much work and the money necessary for expensive campaigning. Frequently, more money may be poured into a "distressed" area than was contributed by the physicians and others in the area.

2. *Defeat our enemies*

This sounds like the reverse of the first item, but that is not necessarily so. If neither candidate in an election seems to be wholly on our side, at least we can vote against the one who is a known enemy. Although it is true that most legislators have their minds made up about basic issues before they get to Washington or Sacramento, some get their best "grass roots education" after election, so one must never give up hope.

3. *Keep up the legislative pressure by the following methods:*

(a) Propaganda to your family. Among other things, be sure to insist that your wife join the Woman's Auxiliary if she is not already a member.

(b) Propaganda to your friends. They respect your beliefs and also respect *you* for *believing.*

(c) Propaganda to your patients. If you do it right, they will respect you and what you have to say. How you do it must be your own idea. What will work for Tom might be poison for Dick and Harry.

(d) Write letters to your government representatives *yourself.*

4. *Never forget that scientific medicine as it is practiced in the United States of America cannot flourish in serfdom.*

The job is yours. But you have help—your wives, the Woman's Auxiliary.

MURIEL F. RUMSEY
Legislative Chairman
Woman's Auxiliary to the
California Medical Association



INFORMATION

Population and Medical Care Expenditure Trends — United States and California: 1976 and 2000

A Report of the Bureau of Research and Planning, California Medical Association

Recent projections by the Outdoor Recreation Resources Review Commission of the Federal government for the years 1976 and 2000 indicate the following regarding population and medical care expenditures.

- U.S. population will rise from the present 190 million to 231 million in 1976 and 351 million in 2000.
- California population will increase from the present 17 million to 41 million by 2000.
- National medical care expenditures will increase from 1959's 6.3 per cent of total personal consumption expenditures to 9.0 per cent.
- State and local expenditures on health (including hospital construction) will increase about 600 per cent, from $3.7 billion in 1959 to $20 billion in the year 2000.

A RECENT PUBLICATION of the Outdoor Recreation Resources Review Commission furnishes projections about the populations of both California and the United States for the years 1976 and 2000. Several of these projections are of interest to the medical profession of California.

Table 1 shows current population figures and projections for the United States. The estimate given is that the total population will be 231 million in 1976 and 351 million by the beginning of the next century. The projections also show a continued change in the composition of the population. The proportion of the population below age 25 is projected to increase from 44.5 per cent in 1960 to 48.9 in the year 2000. The percent of the population between 25 and 74 is expected to decrease from 53.4 per cent of the population to 46.9 per cent, while the population over 75 should increase from 8.8 per cent to 11.8 per cent.

These projections, if valid, imply that acute diseases will increase in incidence, as will diseases of degeneration, while predegenerative chronic diseases of middle age will decrease in relative frequency.

Table 2 shows the projected population of California. Although the population of the nation is not expected to double in the next 40 years, the population of California is expected to increase by a factor of almost two and one-half. California is projected to have a population of 41.3 million people by the year 2000, increasing its share of the nation's population from 8.8 to 11.8 per cent.

With a population increase of this magnitude it becomes apparent that more health personnel will be needed. Furthermore, it is likely that the nature of medical services provided will change to accommodate the population's demand.

Another ORRRC figure of interest is the projection of personal consumption expenditures. As is shown in Table 3, the present trend away from goods and toward services is expected to continue. Medical care and death expenses are projected to increase from 6.3* per cent of 1959 total personal consump-

TABLE 1.—*Projections of the U.S. Population, 1976 and 2000 (Includes Alaska, Hawaii, and Armed Forces Overseas) (In Thousands)*

Age	Actual 1960	Projected 1976	Projected 2000
Under 5	20,321	24,777	39,048
5-9	18,692	22,312	36,792
10-14	16,774	20,730	34,449
15-19	13,219	20,664	32,671
20-24	10,801	19,728	28,218
Total	79,807	108,211	171,178
25-29	10,869	17,979	25,301
30-34	11,949	14,620	22,076
35-39	12,481	12,156	20,852
40-44	11,600	11,267	20,817
45-49	10,879	11,643	19,297
Total	57,778	67,665	108,343
50-54	9,606	11,869	16,973
55-59	8,430	10,830	12,854
60-64	7,142	9,703	10,245
65-69	6,258	7,976	8,933
70-74	4,739	6,027	8,322
Total	36,175	46,405	57,327
75 and over	5,563	8,448	14,222
All Ages	179,323	230,729	351,070

TABLE 2.—*Projections of the California Population, 1976 to 2000 (Includes Armed Forces Stationed Therein, But Not Abroad) (In Thousands)*

	Actual 1960	Projected 1976	Projected 2000
California	15,717	23,744	41,272

Source: Outdoor Recreation Resources Review Commission, Projections to the Years 1976 and 2000; Economic Growth, Population, Labor Force and Leisure, and Transportation, ORRRC Study Report 23, 1962, 454 pages.

*The Bureau of Labor Statistics calculates medical care expenditures as 7.2 per cent and 6.9 per cent of current consumption expenditures in Los Angeles and San Francisco respectively for the year 1960.

TABLE 3.—*Components of Personal Expenditures, 1930 through 2000, U.S.*

	1930		1950		1955-57		1959		1976		2000	
	Personal consumption expenditures (billions of 1959 dollars)	Per cent of total expenditures	Personal consumption expenditures (billions of 1959 dollars)	Per cent of total expenditures	Personal consumption expenditures (billions of 1959 dollars)	Per cent of total expenditures	Personal consumption expenditures (billions of 1959 dollars)	Per cent of total expenditures	Personal consumption expenditures (billions of 1959 dollars)	Per cent of total expenditures	Personal consumption expenditures (billions of 1959 dollars)	Per cent of total expenditures
Food, liquor, and tobacco	37.6	28.8	69.3	29.6	80.4	28.2	85.2	27.2	154.6	23.9	310.7	23.2
Clothing, accessories and jewelry	18.5	14.2	28.0	11.9	31.1	10.9	33.0	10.5	51.7	8.0	100.1	7.5
Personal care	1.9	1.5	3.0	1.3	3.9	1.4	4.7	1.5	9.1	1.4	19.1	1.4
Housing	19.2	14.7	27.5	11.7	35.2	12.3	40.5	12.9	80.8	12.5	144.2	10.8
Household operations	17.3	13.3	34.6	14.8	40.7	14.2	43.9	14.0	100.3	15.5	204.4	15.3
Medical care and death expenses	6.0	4.6	12.3	5.2	16.4	5.7	19.7	6.3	48.5	7.5	120.9	9.0
Personal business	7.0	5.4	10.4	4.4	15.4	5.4	18.6	5.9	37.5	5.8	82.7	6.2
Transportation (including vehicles)	11.1	8.5	29.1	12.4	37.1	13.0	38.9	12.4	105.0	16.2	216.5	16.2
Recreation	7.2	5.5	13.5	5.8	16.0	5.6	18.3	5.8	38.8	6.0	84.3	6.3
Private education, and research	1.2	0.9	2.3	1.0	3.1	1.1	3.9	1.2	9.1	1.4	25.2	1.9
Religious and welfare activities	2.1	1.6	3.1	1.3	3.7	1.3	4.3	1.4	7.1	1.1	13.8	1.0
Foreign travel (net)	1.3	1.0	1.3	0.6	2.6	0.9	2.8	0.9	4.0	0.7	16.7	1.2
Total personal consumption expenditures	130.4	100.0	234.4	100.0	285.6	100.0	313.8	100.0	646.6	100.0	1,338.6	100.0
Durable goods	12.7	9.7	34.3	14.6	41.4	14.5	43.4	13.8	121.3	18.8	233.2	17.4
Nondurable goods	65.9	50.6	115.9	49.5	137.4	48.1	147.6	47.0	275.5	42.6	565.1	42.2
Services	51.8	39.7	84.2	35.9	106.8	37.4	122.8	39.2	249.8	38.6	540.3	40.4

TABLE 4.—*State and Local Expenditures on Health and Hospitals, 1952 through 2000, U.S.*

Year	Total expenditures (billions of 1959 dollars)	Per cent of state and local government expenditures	Per capita expenditure (1959 dollars)
1952	2.6	9.3	16
1953	2.6	9.2	17
1954	2.7	8.4	16
1955	2.9	8.4	17
1956	3.0	8.3	18
1957	3.4	8.7	20
1958	3.6	8.7	21
1959	3.7	8.4	21
1976	11.7	9.4	49
2000	20.0	8.1	57

tion expenditures to 9.0 per cent in 2000. Food, liquor, and tobacco, as well as housing, are likely, according to this report, to diminish in relative importance, from over 40 per cent in 1959 of total expenditures to little more than 30 per cent in 2000.

Table 4 shows the past and projected State and local expenditures on health, including hospital construction—an increase of about 600 per cent between 1959 and 2000. This would mean (in terms of 1959 dollars) an increase of $36 per capita, from $21 in 1959 to $57 in 2000.

693 Sutter Street, San Francisco, California 94102.

AMA Positions on Discrimination, Smoking

Two actions of outstanding importance taken by the House of Delegates of the American Medical Association at its meeting in San Francisco in June were the passage of an anti-discrimination resolution and the adoption of a statement of position on smoking as a hazard to health. Since these matters which are of pressing concern to the medical community and to the public at large have been variously and often not fully reported, the full text of both of these statements of position is printed herewith.

On Discrimination:

WHEREAS, there is no basis for the denial to any human being of equal rights, privileges and responsibilities commensurate with his or her individual capabilities and ethical character, regardless of race, color, religion, ethnic affiliation, or national origin; therefore be it

Resolved, That this House of Delegates of the American Medical Association is unalterably opposed to the denial of membership, privileges and responsibilities in county medical societies and state medical associations to any duly licensed physician because of race, color, religion, ethnic affiliation, or national origin, and be it further

Resolved, That this House of Delegates of the American Medical Association call upon all state medical associations, all component societies, and all individual members of the American Medical Association to exert every effort to end every instance in which such equal rights, privileges or responsibilities are denied.

On Smoking:

The following is the statement on smoking as recommended by the report of the Reference Committee on Public Health and Occupational Health and adopted by the House of Delegates:

1. Having reviewed the actions of the House of Delegates of the American Medical Association, available printed information, and very excellent testimony before the reference committee, it became evident to your committee that the American Medical Association is on record and does recognize a significant relationship between cigarette smoking and the incidence of lung cancer and certain other diseases, and that cigarette smoking is a serious health hazard.

2. The AMA recognizes the contribution of the Surgeon General's Committee in its comprehensive report. In keeping with one of the recommendations of this report, the American Medical Association and the National Education Association through their Joint Committee on Health Problems in Education, have adopted a resolution urging elementary and secondary schools to include programs on smoking and health in their health education curricula. Your reference committee commends this action, recommends its continuation, and in addition, urges the AMA to keep the constituent and component medical associations and their individual members advised as to how they might best utilize this information. In addition, we recommend that programs be developed to disseminate this vital health education material on the hazards of smoking to all age groups through all available means of communication.

3. Included in the material available to your committee was an AMA pamphlet entitled "Smoking: Facts You Should Know" prepared for public distribution. Your reference committee critically reviewed the initial edition of this pamphlet and believes that, in the light of accumulating knowledge, the pamphlet is in need of modification in its revision.

4. The American Medical Association House of Delegates, in a policy statement of June 1963, recognized the deleterious effects of tobacco on human health and indicated that extensive research is necessary to clarify its exact relationship to health. Because of this, your reference committee believes that the AMA House of Delegates and the Board of Trustees should take great pride in the establishment of the research program that is being carried out by the American Medical Association Education and Research Foundation under the direction of a committee of five scientists, three of whom were members of the Surgeon General's Committee.

LETTERS *to the Editor*

Toward a Safer Baby Bed

ONE MORNING RECENTLY, my wife placed our eleven-month-old daughter in her crib for her usual morning nap. About fifteen minutes later she heard an unusual type of crying and upon entering the baby's room found that the baby had worked her body through the wood slats of the side of the crib and was hanging by her head, as shown in Figure 1. The baby's feet were about eight inches from the floor. Due to immediate relief, no serious injury to the baby occurred but this incident caused me to seek ways of preventing any such future accident.

Investigation of the available cribs in this area showed them to be variously priced and adorned, but most of them presented the same basic construction. The spaces between the wood slats of the sides were all 3½ inches. Generally the bed springs were adjustable to three different heights.

At about the same time as this incident, I became aware that even after lowering the bed springs to their lowest level, the baby could and would crawl over and topple out of the bed. The side extensions were purchased and added to the height of the sides but this did not correct the ends of the bed; one end of this particular crib was constructed so that the baby could use it as a ladder to get up and over, as in Figure 2.

I next purchased a crib with a metal frame, solid ends and netting for the sides, but due to the size of the netting the baby could use this as a ladder also.

The final result, which is clumsy and awkward to get into is shown in Figure 3. This crib has been modified in these ways:

1. The bed springs have been dropped several inches below the rests which came with the bed.
2. Side extensions have been added.
3. The inside of sides have been lined with netting to prevent baby from squirming through and hanging herself.
4. The top of the crib is covered with a net purchased through a local hospital.



Figure 1.—Reconstruction of the accident using a life size doll. A baby's body, though bulky, is compressible and can be squirmed through the 3½ inch space; the head cannot pass, so the baby hangs by the head with feet dangling.



Figure 2.—Baby crawls over end of crib using netting and construction defect in end of crib as a ladder.



Figure 3.—Crib modified by lowering bed springs, adding side extensions and netting to top and sides—awkward but safe.

All this seems so unnecessary when a few changes in the manufacture of baby cribs could be made. I would recommend the following:

1. The bed springs should be adjustable to different heights and especially should be capable of being lowered close to the floor so that baby cannot crawl out. During the first few months of life the mattress should be at an appropriate height so that mother (father?) doesn't have to get down on her knees every fifteen minutes to change the diapers.

2. If the sides are going to be made of wood slats, they should be close together with no greater than a two inch space between each slat. It seems to me that a very fine nylon-like netting would be best so that parents could see baby and vice-versa; there is no use in giving baby a prisoner's view of the world during his formative period. If netting is used, it must be fine enough so that baby won't use it as a ladder.

3. As an added safety measure, the crib should have some sort of top; this should be easily opened so that access to baby is rapid and relatively noiseless.

4. The movable side(s) of the crib should be so constructed that it will not accidentally fall down or its mechanism be available to the baby.

JOHN E. SUMMERS, M.D.
Sacramento



NEWS & NOTES

NATIONAL • STATE • COUNTY

Dr. Roger O. Egeberg, who has been a member of the faculty since 1956, was appointed dean of the University of Southern California School of Medicine late last month by Dr. Norman Topping, president of the university.

The new dean will succeed Dr. Clayton G. Loosli, who announced last January that on August 31 he would become medical director of the Hastings Foundation, a USC affiliate supporting a research program in respiratory diseases.

Dr. Egeberg has been medical director for the Los Angeles County Department of Charities for the past six years. From 1956 to 1958 he was medical director of the Los Angeles County General Hospital where USC does its clinical teaching. From 1946 to 1956 he was chief of medical and professional services at the Veterans Administration Hospital in Los Angeles.

A graduate of Cornell and Northwestern universities, Dr. Egeberg received his specialty training in internal medicine at the University of Michigan. He was also on the faculty at Michigan and at Western Reserve University's School of Medicine. After ten years of private practice in Cleveland he entered the army in World War II, went overseas with the 4th General Hospital to Australia, where he became the personal physician and then aide-de-camp to the late General of the Army Douglas MacArthur.

Dr. Egeberg has done research on coccidioidomycosis and has conducted pilot studies in home medical care. He takes up his new position as the USC School of Medicine presses into a plan of expansion. It has three major buildings on the drawing boards and it also has under consideration plans to enlarge its medical student enrollment, which at present is 68 students per class.

Dr. Egeberg is a fellow of the American College of Physicians, a Diplomate of the American Board of Internal Medicine, a member of the board of directors of the National Foundation for Arthritis and Rheumatism, and a past president of the Los Angeles Society of Internal Medicine. He is also a director of Barlow Sanatorium, Los Angeles, and a director of the California Division of the American Cancer Society.

He was chairman of the Governor's Committee on the Study of Medical Aid and Health in California during 1959-60, has been a member of the California State Board of Public Health since 1961 and is now its president.



ROGER O. EGEBERG, M.D.
Dean, USC School of Medicine

FRESNO

The Fresno County Medical Society Scholarship Foundation has awarded assistance grants totaling $2,000 to four young residents of Fresno County. The grants, which are the Foundation's first, will help the recipients to start advanced schooling careers in dentistry and nursing.

The Scholarship Foundation was established by the Medical Society with some $63,000 in excess funds from the **Sabin Oral Sunday** clinics that were conducted in Fresno County in 1962-63. It will make scholarship awards each year to qualified county residents training for careers in medicine, dentistry, pharmacy or nursing.

Scholarships are for one year. They amount to a maximum of $1,000 a year for medical students, $750 for dentistry or pharmacy students and $250 for nurses. Recipients may apply for further aid later.

Dr. H. M. Ginsburg is chairman of the advisory committee that administers the Foundation and the other committee members are Drs. Fred E. Cooley, J. M. Arthur, Harlan F. Fulmer and John P. Conrad, Jr.

LOS ANGELES

Dr. Justin J. Stein, Los Angeles, chairman of the CMA Committee on Scientific Information, has been elected to the board of trustees of the American Board of Radiology for a six-year term.

Dr. Stein is professor of radiology and chief of the radiotherapy division at the University of California at Los Angeles. He is a past chairman of committees on disaster medical care of the California Medical Association and the American Medical Association.

* * *

The Childrens Hospital of Los Angeles will hold the third **Clinical Conference in Pediatric Anesthesiology** on January 29, 30, 31, 1965. The three day program will be devoted to the practical management of infants and children.

Further information can be obtained by writing to Dr. M. Digby Leigh, Childrens Hospital of Los Angeles, 4614 Sunset Boulevard, Los Angeles 27, California.

* * *

Appointments to two **California College of Medicine** committees have been announced by Dr. W. Ballentine Henley, president, on recommendations by Dr. Warren Bostick, dean. Also announced was the appointment of Dr.

James E. Lyster as clinical instructor in obstetrics and gynecology.

Appointees to the **Committee on Buildings and Campus Development** are Drs. J. Edward Burke, James McClure, David Payne, Richard Stuart and Thomas Nelson. This committee will function as an overall planning group concerned with implementation of the master plan for college development.

Members of the **Basic Science Building** committee are Dr. Henley, Dr. Lyle Deardon (chairman), Associate Dean Grace Bell, Richard Croft, Mrs. Mary Fullington, and Drs. Wilbur Brandt, Robert Earle, Wayne Hull, Milton Kaplan, Edmund Low, Stanley Rokaw and William Thompson, Jr. This group will function as a sub-committee for the Committee on Buildings and Campus Development to provide a planning guide for construction of the new science building on campus.

* * *

Officers of the **Los Angeles Radiological Society** who will take office on September 1 are: President, Dr. Saul Heiser; vice-president, Dr. Chester P. Bonoff; treasurer, Dr. Victor G. Mikity; secretary, Dr. Austin R. Wilson.

SANTA CRUZ

An endowment fund of $12,475, the proceeds of which will be used for a scholarship, has been presented to the University of California, Santa Cruz, by the **Santa Cruz County Medical Society.**

The Society stipulated that the **scholarship** should go to a resident of Santa Cruz County attending UCSC who was majoring in the health sciences.

The money, contributed at the time of the **KO Polio Campaign** last year, was from the surplus over out-of-pocket cost of the Sabin vaccine program.

GENERAL

The Second National Congress on Mental Illness and Health, sponsored by the Council on Mental Health of the American Medical Association, will be held November 5-7 in Chicago. "This meeting," according to the AMA announcement, "will be another step in the development of community resources as the primary line of defense against mental illness." Further information is available from the Council, care of American Medical Association, 535 N. Dearborn, Chicago 60610.

EDUCATION NOTICES

Meetings and Courses

COMMITTEE ON CONTINUING MEDICAL EDUCATION

THIS BULLETIN of the dates of continuing education programs and the meetings of various medical organizations in California is supplied by the Committee on Continuing Medical Education of the California Medical Association. In order that they may be listed here, please send communications relating to your future meetings or postgraduate courses to Committee on Continuing Medical Education, California Medical Association, 693 Sutter Street, San Francisco, California 94102.

Medical Meetings

SEPTEMBER MEETINGS

September 10-12—**Annual Saint John's Hospital Postgraduate Assembly.** Hospital Auditorium, Saint John's Hospital, Santa Monica. Thursday-Saturday. Contact: John C. Eagan, M.D., director, Saint John's Hospital, 1328 Twenty-second Street, Santa Monica.

September 10-November 5—**Stockton Postgraduate Study Club.** Scottish Rite Temple, 33 West Alpine, Stockton. Thursdays weekly, except October 1. Contact: James V. Roche, M.D., program chairman, 645 West Harding Way, Stockton.

September 15-October 20 — **San Francisco Academy of General Practice Fort Miley Symposium.** Auditorium, Veterans Administration Hospital, San Francisco. Six consecutive Tuesdays. Contact: Forrest M. Willett, M.D., 42nd Avenue and Clement Street, San Francisco 94121.

September 19—**Second Northern California Athletic Injury Conference.** Sponsored by Butte-Glenn Medical Society and Chico State College. To be held at Chico State College 8:30 a.m. to 5:30 p.m., Saturday. Contact: Robert S. Johnson, M.D., chairman, 4 Cohasset Circle, Chico.

September 21-24—**Poison Information Activities: Whither Now?** Sponsored jointly by the Childrens Hospital of Los Angeles, the Thomas J. Fleming Poison Information Center and the California State Department of Public Health. Los Angeles. Monday-Thursday. Tuition: $40. Contact: W. H. Bucher, M.D., director, Childrens Hospital of Los Angeles, 4614 Sunset Blvd., Los Angeles 90027.

September 24-26—**American College of Obstetricians and Gynecologists** (District 8). San Diego. Thursday-Saturday. Contact: Donald F. Richardson, executive director, 79 West Monroe, Chicago 3.

September 26-29—**Annual Western Divisional Meeting of the American Psychiatric Association.** St. Francis Hotel, San Francisco. Saturday-Tuesday. Contact: William Bellamy, M.D., 450 Sutter Street, San Francisco 94108.

September 27-October 2—**Flying Physicians Association.** Tenth Annual Meeting. Riviera Hotel, Palm Springs. Sunday-Friday. Contact: John C. Chatterton, staff representative, Flying Physicians Association, 332 South Michigan Avenue, Chicago 60604.

September 30-October 2 — **34th Annual Postgraduate Symposium on Heart Disease**—St. Francis Hotel, San Francisco. Contact: Mr. Gene C. Taylor, executive director, San Francisco Heart Association, 259 Geary Street, San Francisco.

OCTOBER MEETINGS

October 5-7—**The American College of Physicians Fall Sectional Meeting.** Biltmore Hotel, Los Angeles. Monday-Wednesday. Contact: Edward C. Rosenow, Jr., M.D., executive director, The American College of Physicians, 4200 Pine Street, Philadelphia 4, Pennsylvania.

October 11-16—**American Society of Plastic and Reconstructive Surgeons.** Fairmont Hotel, San Francisco. Sunday-Friday. Contact: Paul P. Pickering, M.D., executive secretary, 2850 Sixth Avenue, Suite B, Lower Level, San Diego.

October 16-17—**Western Industrial Medical Association.** Biltmore Hotel, Los Angeles. Friday-Saturday. Contact: Christine Einart, M.D., executive secretary, 2151 Berkeley Way, Berkeley 4.

October 25-28—**Academy of General Practice 16th Annual Scientific Assembly.** Hilton Hotel, San Francisco. Sunday-Wednesday. Sir John Bruce, Professor of Clinical Surgery, University of Edinburgh, Scotland, will be one of the principal speakers. Contact: Academy of General Practice, No. 9 First Street, San Francisco.

NOVEMBER MEETINGS

November 3-6—**Present Concepts in Internal Medicine.** Letterman General Hospital, San Francisco. Tuesday-Friday. Contact: Commanding General, Attn.: MEDES-PT, Letterman General Hospital, San Francisco 94129.

November 4-7—**Nevada State Medical Association and Reno Surgical Society—Joint Meeting.** Reno, Nevada. Wednesday-Saturday. Registration: $20. Contact: Nelson B. Neff, executive secretary, Nevada State Medical Association, 3660 Baker Lane, Reno.

November 7—**Forty First Medical Society Convention: "Man's Reaction to Catastrophe."** Riviera Hotel, Palm Springs. Saturday. Contact: John M. Addington, administrative director, Forty First Medical Society, 4775 Santa Monica Blvd., Los Angeles 90029.

November 12-15—**San Diego Chapter of the California Academy of General Practice Scientific Symposium.** Flamingo Hotel, Las Vegas. Contact: Vincent F. Biondo, M.D., 5548 El Cajon Blvd., San Diego 92115.

November 14—**Annual Institute in Child Psychiatry for Pediatricians.** Reiss-Davis Clinic for Child Guidance. Co-sponsored by the Southern California Chapter of the American Academy of Pediatrics. Saturday. Contact: R. L. Motto, M.D., director, Reiss-Davis Clinic, 9760 West Pico Blvd., Los Angeles 90035.

DECEMBER MEETINGS

December 1-4—**Annual Presentation of the Postgraduate Course in Cardiology: "The Heart in the Electronic Age."** Scripps Clinic and Research Foundation, La Jolla. Tuesday-Friday. Contact: Harold M. Lowe, M.D., Scripps Clinic and Research Foundation, 476 Prospect Street, La Jolla.

December 2-4 — **West Coast Allergy Society Annual Meeting.** Ambassador Hotel, Los Angeles. Wednesday-Friday. Contact: Jack M. Chesebro, executive secretary, 1818 S.E. Division, Portland 2.

January 22-24—**Annual Meeting of the Southern California Chapter, American College of Surgeons.** Palm Springs. Sunday-Tuesday. Contact: Russell Smith, M.D., chairman, 1930 Wilshire Blvd., Los Angeles.

January 27-30 — **The American Group Psychotherapy Association.** San Francisco. Wednesday-Saturday. Contact: Donald A. Shaskan, M.D., president, 49 Fourth Street, San Francisco.

February 13-14 — **Pediatric Surgery Symposium.** Presented by Childrens Hospital of Los Angeles. Saturday-Sunday. Contact: Newlin Hastings, M.D., program chairman, 4614 Sunset Blvd., Los Angeles 90027.

February 20-21—**Pediatric Urologic Seminar.** Childrens Hospital, Los Angeles. Saturday-Sunday. Contact: H. H. Edelbrock, M.D., 6753 Hollywood Blvd., Los Angeles 90028.

April 4-8—**Annual Clinical Meeting of the American College of Obstetricians and Gynecologists.** Civic Auditorium, San Francisco. Sunday-Thursday. Contact: Robert A. Kimbrough, M.D., director, 79 West Monroe Street, Chicago 60603.

Postgraduate Education

Audio-Digest Foundation

Audio-Digest Foundation (a non-profit subsidary of the California Medical Association) provides by subscription twice-a-month tape-recorded summaries of leading national meetings and authoritative surveys of current literature. Seven separate services in: General Practice, Surgery, Internal Medicine, Obstetrics-Gynecology, Pediatrics, Anesthesiology, and Ophthalmology. A new Catalog of outstanding lectures and panel discussions in all areas of medical practice is also available. For information, write: Mr. Claron L. Oakley, Editor, 619 South Westlake Avenue, Los Angeles.

Presbyterian Medical Center

November 14—**Gastroenterology.** Saturday. 8 hours. $25.

December 12—**Minor Surgery, Office and Hospital.** Saturday. 8 hours. $25.

For information contact: Arthur Selzer, M.D., chairman, Education Committee, Presbyterian Medical Center, Clay and Webster Streets, San Francisco 94115. WEst 1-8000.

University of California at Los Angeles

August 12-16—**Fifth Annual Advanced Seminars in Dermatology.** University of California Residential Conference Center, Lake Arrowhead. Wednesday-Sunday. $100 plus room and board.

August 20-22—**Progress in Obstetrics.** Thursday-Saturday. 18 hours.*

August 23-26—**Seminars on Medical Teaching.** University of California Residential Conference Center, Lake Arrowhead. Sunday-Wednesday. No fee.†

October 16-November 6—**Postgraduate Medical Lecture Series in Australia and New Zealand.** Monday-Friday. 32 hours. $200.

Dates by Arrangement—**Clinical Traineeship**—Anatomy, Anesthesia, Dermatology, Pediatrics, Radioisotopes, Urology: 2 weeks, $150; 4 weeks, $250. Minimum period, 2 weeks.

For information on courses for physicians or ancillary personnel contact: Thomas H. Sternberg, M.D., Assistant Dean and Head, Department of Continuing Education in Medicine and Health Sciences, U.C.L.A. Medical Center, Los Angeles 90024, 478-9711, Ext. 2114.

Loma Linda University

As Arranged—**Traineeships** in clinical and other departments are available by arrangement with department chairmen of the Postgraduate Division. 80 hours minimum.

Anesthesia, 6 months. 250-300 hours. $350.

Pulmonary Diseases—can be arranged.

Continuously—**Illustrated Medical Lectures:** 30-minute tape recordings and accompanying 35-mm filmstrip, 50 to 80 full-color pictures for screen, hand or desk viewer. Available individually or by subscription. 12 or 36 titles per year, all titles produced in one year in any chosen specialty. Projectors and viewers included in subscription plans. Contact: Loma Linda University, Illustrated Medical Lectures, Los Angeles 33.

For course information contact: W. F. Norwood, Ph.D., Assistant Dean and Chairman, Division of Continuing Education, Loma Linda University School of Medicine, 1720 Brooklyn Ave., Los Angeles, California 90033, ANgelus 9-7241, Ext. 214.

University of California, San Francisco

September 8-April 27—**Radiological Physics.** Tuesday evenings. 45 hours. $150.

September 14-16—**Recent Advances in Internal Medicine: Clinics and Demonstrations.** Monday-Wednesday. 17 hours. $60.

September 15-December 8—**Medical Radio Conferences.** Northern California.*†

September 17-December 10—**Medical Radio Conferences.** Northern California.*†

September 18-19—**Pediatrics—Cerebral Palsy and Related Disorders.***†

September 18-October 23—**Neuropsychiatric Management in Daily Practice.** Modesto State Hospital. Friday evenings. 12 hours. $10.

September 22-October 27—**Mental Retardation: Problems and Approaches.** Sonoma State Hospital. Tuesday evenings. 12 hours. $10.

September 23-December 16—**Psychotherapeutic Principles and Practice for Non-Psychiatrists.** Langley Porter Neuropsychiatric Institute. Wednesdays. 72 hours. $25.

September 24-October 29 — **Psychosomatic Aspects of Daily Practice.** Napa State Hospital. Thursday evenings. 12 hours. $10.

September 26-27—**Complications: Medical and Surgical Management.** Franklin.*†

September 26-27—**Neuropsychiatry for the Non-Psychiatric Physician in General Practice.** Sacramento.*†

September 29-November 3 — **Clinical Considerations in Mental Retardation.** Sonoma.*†

October 3-4—**Psychiatric Management in General Medicine.** San Mateo.*†

October 6-December 8—**Evening Lectures in Medicine.** Oakland Hospital. Tuesday evenings. 16 hours. $35.

October 8-10—**Obstetrics and Gynecology.***†

October 10-11—**Cytology Symposium.***†

October 13-November 24—**Neuropsychiatry in Daily Practice.** Agnews State Hospital. Tuesday evenings. 12 hours. $10.

October 16-17—**Surgery of the Hand and Forearm.***†

October 17—**Infectious Diseases in Childhood.** Children's Hospital.*†

October 30-November 1—**Symposium on Mental Retardation for General Practitioners, Non-Psychiatrists and Paramedical Specialists.***†

November 7-8 — **Postgraduate Seminar in Psychiatry.** Fresno Community Hospital. Saturday-Sunday. $10.†

November 7-December 12 — **Postgraduate Seminars in Clinical Sciences.** Mercy Hospital.*†

November 21-22 — **Problems in Community Mental Health.** Saturday-Sunday.*†

November 22-24—**Neurology.** Sunday-Tuesday.*†

December 2-5—**Retinal Diseases: A Symposium on Differential Diagnostic Problems of Posterior Uveitis.** Wednesday-Saturday. 25 hours. $85.

December 4-5—**Basic Electrocardiography.** Friday-Saturday.*†

December 12-13—**Psychiatric Perspectives in Medicine.** Stockton State Hospital. Saturday-Sunday.*†

Continuously—Courses presented by special arrangement: **Principles and Clinical Uses of Radioisotopes** (full time, one to three months).

For information on courses for physicians or ancillary personnel, contact: Seymour M. Farber, M.D., Assistant Dean, Dept. of Continuing Education in Medicine and Health Sciences, University of California Medical Center, Room 565-U, San Francisco 94122, MOntrose 4-3600, Ext. 179.

University of Southern California

October 18-November 9 — **Medical Centers of South America.** 36 hours. $210.

Continuously—**Basic Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $100. Physicians may register at any time.

Continuously—**Advanced Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $85. Physicians may register at any time.

For course information contact: Phil R. Manning, M.D., Assoc. Dean, Postgraduate Division, USC School of Medicine, 2025 Zonal Ave., Los Angeles 90033, CApital 5-1511, Ext. 300.

*Fee to be announced.
†Hours to be announced.

The Physician's BOOKSHELF



HEY GROVES' SYNOPSIS OF SURGERY—Sixteenth Edition—Edited by L. T. Cotton, M.A., M.Ch. (Oxon.), F.R.C.S. (Eng.), Consultant Surgeon to King's College Hospital and Belgrave Hospital for Children; Honorary Surgeon to Queen Victoria Hospital, East Grinstead; Surgical Tutor at King's College Hospital Medical School. The Williams & Wilkins Company, Baltimore 2, Md., 1963. 778 pages, $9.00.

The fact that this is the sixteenth edition of this synopsis of surgery attests to its stability and value. Much new material has been added to this book, and an attendant pruning of outdated material from former volumes has permitted the book to remain approximately the same size and be a true synopsis of surgery. All branches are reviewed, including thoracic, plastic, neurological and vascular surgery.

It is surprising how up to date the book is in its discussions of these various general surgical problems, and problems in the surgical specialties. The sections on burns, skin grafting, orthopedic problems, blood transfusions, gastric surgery, cardiac surgery and vascular surgery are excellent summaries of the current status of knowledge in these fields. The book is written in an outline form, and a great deal of information is compressed in a carefully presented manner, with appropriate headings, subheadings and major areas being appropriately captioned so that the information is easy to follow and easy to comprehend.

The book would be particularly valuable for those who wish a quick review of the aspects of general specialty surgery. It would be good for students and busy practitioners who would like to keep abreast of the ever advancing science of surgery, and who do not have time to read the big books or study current magazine articles. The summary form, with the special arrangements of headings, type and indented margins, enables the reader to follow the scope of the subject at a glance, and to obtain the information he seeks with readiness and alacrity. Only the main points of operations are referred to, and the technical aspects of surgery are left for larger and more specialized works.

This little book is recommended for those who wish a rapid summary of general and specialty surgery.

VICTOR RICHARDS, M.D.

* * *

LYSOSOMES—Ciba Foundation Symposium—Edited by A. V. S. de Reuck, M.Sc., D.I.C., A.R.C.S., and Margaret P. Cameron, M.A. Little, Brown and Company, Boston, Mass., 1963. 446 pages, $11.50.

This book represents a field of knowledge developed during the last ten years that has had much influence upon cellular physiologists and others concerned with intracellular processes. Lyosomes are tiny cytoplasmic particles distinct from mitochondria that contain stores of hydrolytic enzymes in high concentration. They can be isolated from cell homogenates and can be identified within cells by electron microscopy, which has contributed evidence that they are related to the Golgi apparatus and probably play an important role in a variety of cellular functions. Although agreed upon the general character of these remarkable intracellular organelles, different scientists have diverse views as to their specific roles. The Ciba Symposium, reported in this book, succeeded in creating a discussion of these views by assembling the principal investigators of lysosomal behavior. The collected articles are comprehensive, lucid and lively, so a minimum background is needed to appreciate this informative survey of knowledge relative to these cell structures. The final chapter gives some brief statements of the fundamental biological importance of these particles and their probable significance in basic disease processes, including inflammation, hormonal interrelationships and immunity.

ALVIN J. COX, M.D.

* * *

PEDIATRIC THERAPY — Harry C. Shirkey, B.S. (Pharm.), M.D., F.A.A.P. (Editor), Director, The Children's Hospital of Birmingham, Alabama; Associate Professor of Pediatrics, Medical College of Alabama, Birmingham, Ala., Member, Revision Committee, United States Pharmacopeia; Professor of Pharmacology, Howard College, Birmingham, Ala. The C. V. Mosby Company, St. Louis, Mo., 1964. 1144 pages, $16.50.

Textbooks of pediatrics, of which there are currently several—some of them of top quality, inevitably cover the subject of therapy. A textbook of pediatric therapy inevitably covers the subjects of etiology and diagnosis.

Thus, the volume here described is in some measure another textbook of pediatrics. However, those who seek a more detailed coverage of therapy of practically all disorders encountered in children will find this an adequate, complete and thorough coverage of the subject. This book is especially good and unique in the information it has on drugs crossing the placenta and drugs secreted in breast milk (which is difficult to find elsewhere). It is generously illustrated with useful tables and photographs. The 72 contributors include some of the best known authorities as well as several newcomers to the field of pediatric texts.

The book is recommended to medical libraries and teaching centers, and pediatricians will do well to consider its addition to their available references.

* * *

PROBLEMS OF SLEEP AND DREAMS IN CHILDREN—Edited by Ernest Harms—A Pergamon Press Book—Distributed in the U.S. by The Macmillan Company, New York, 1964. 147 pages, $6.50.

This volume, the second in a series of monographs on child psychiatry edited by Ernest Harms, consists of twelve essays on problems of sleep and dreams in children contributed by a number of writers from the United States and from continental Europe. The essays deal with physical and psychologic factors involved in the etiology of sleep and dreams, as well as with the psychopathology of sleep disorders. Since a minimal amount of study has thus far been devoted to the physiologic and psychologic aspects of sleep and dreams in children and since many inferences drawn from work with adults and from childhood disorders may not be applicable to the developing child, there is much difference of opinion concerning psychologic aspects of dreams in children. The authors of these essays represent

various schools of dynamic psychiatry and offer differing points of view on the subject.

Many chapters in the monograph are engaged more in controversial discussion than in the presentation of scientific information. The primary purpose of two of the chapters is to negate Freud's interpretation of dreams, but the authors tend to utilize Freud's concept erroneously in an attempt to refute some of his basic principles. One chapter deals primarily with specific dream problems in adults that have little relevancy to children. Three chapters deal with the pathology of sleep in children, but these are largely descriptive and do not consider the dynamic aspects of the etiology of sleep problems. Nevertheless, attention is called to the tendency of physicians to overuse drugs in the treatment of sleep problems in children and emphasizes the need for early diagnosis. Schachter presents an interesting study of sleep rocking in children. His clinical examination of thirty-five cases shows a high frequency of psychoneurotic disorders among these children. He considers that these rhythm patterns are relatively benign and have a tendency to disappear. He does, however, neglect to consider other symptoms or character traits that may replace a sleep disturbance in children with emotional difficulties.

Some extremely good chapters in the book merit special consideration. A report by Ames summarizes the work of the Gesell Institute on sleep and dreams in children. This survey describes the normal development of sleep trends and dreaming periods in infancy, childhood, and adolescence and will be of use to persons in pediatric and child development fields. Unfortunately, although the latter part of the chapter deals with sleep difficulties and problems, it neglects the dynamic factors involved in such disturbances and deals, for the most part, with symptoms and ready-made answers for their resolution. The solutions presented for many problems are somewhat naive: "Many mothers plan with the child that he will stop rocking (or banging) when they tap on the wall . . . or plan ahead with him that when he is four he won't need to rock (bang) any more when he shifts to his own big bed." The deficiencies of this chapter are remedied, however, by the excellent discussion of Finch and Kemph on the etiology of sleep, in which they review the literature on the etiology of sleep and discuss in detail intrapsychic factors related to sleep as well as some practical considerations for helping children with sleep problems. This illuminating chapter will be of great value to all who work with children.

An interesting chapter on research by Roffwarg, Dement, and Fisher presents their findings on sleep-dream patterns in neonates, infants, children, and adults. They describe the considerable activity that occurs during sleep and the need for its discharge during this period. They present an interesting hypothesis that persons who rely on repression and denial to bind anxiety show less dream time per cent of sleep than do those persons who utilize other defense mechanisms. Two essays on the utilization of adult dream material, which make retrospective inferences concerning children, are largely Jungian in approach and, although interesting, seem to add little to our knowledge and understanding of the subject.

In general, this monograph presents very few papers that add usefully to a meager literature in the field. It is to be hoped that planned further monographs in this series on child psychiatry will shed more scientific light and generate less of the heat of controversy.

IRVING PHILIPS, M.D.

RESULTS OF SURGERY FOR PEPTIC ULCER—A Cooperative Study by Twelve Veterans Administration Hospitals—Edited by R. W. Postlethwait, M.D.; associate editor, James C. Thoroughman, M.D.; in collaboration with Philip Cooper, M.D.; Thomas M. Dunn, M.D.; Walter G. Gobbel, Jr., M.D., H. Stuart Irons, Jr., M.D.; Lyndon E. Lee, Jr., M.D.; Louis T. Palumbro, M.D.; Lloyd S. Rogers, M.D.; Stanley H. Schonberger, M.D.; Joseph A. Weinberg, M.D. With a foreword by Lester R. Dragstedt, M.D. W. B. Saunders Company, West Washington Square, Philadelphia 5, Pa., 1963. 308 pages, $8.00.

This book is a very comprehensive review of the results in the surgical treatment of peptic ulcer, resulting from a cooperative study by twelve Veterans Administration Hospitals. The material has been very carefully gathered and thoroughly reviewed, and the conclusions would seem highly reliable since they result from a careful analysis of an extremely large volume of material. It would appear that the results from vagotomy and pyloroplasty, or vagotomy and limited resection equal those from extensive gastric resections, and in many situations result in a lower mortality and morbidity from avoidance of the problems of leakage at the duodenal stump. For those who desire a detailed review of actual experiences in a large group of diversified hospitals, this book is recommended. There is nothing new in it of a physiological nature. The discussions concerning mechanisms of gastric secretions, new diagnostic techniques in complex ulcer problems are lacking, and its prime virtue is in gathering together results on a sound and reliable basis from which we can assess our own knowledge and experience.

V. RICHARDS, M.D.

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EXPERIMENTAL SURGERY—Including Surgical Physiology—Fifth Edition—J. Markowitz, M.B.E., M.B. (Tor.), Ph.D., M.S. in Exp. Surg. (Minn.), Professor of Physiology, University of Toronto; Visiting Professor of Physiology, Ontario Veterinary College, Guelph, Ont.; J. Archibald, D.V.M., M.V.Sc. (Tor.), Dr. med. vet. (Giessen), M.R.C.V.S., Professor & Head of the Division of Small Animal Medicine and Surgery, Ontario Veterinary College, Guelph, Ont.; and H. G. Downie, D.V.M. (Tor.), M.S. (Cornell), M.V. Sc. (Tor.), Ph.D. (Western Ontario), Professor & Head, Department of Physiological Sciences, Ontario Veterinary College, Guelph, Ont. The Williams & Wilkins Company, Baltimore 2, Md., 1964. 659 pages, $13.00.

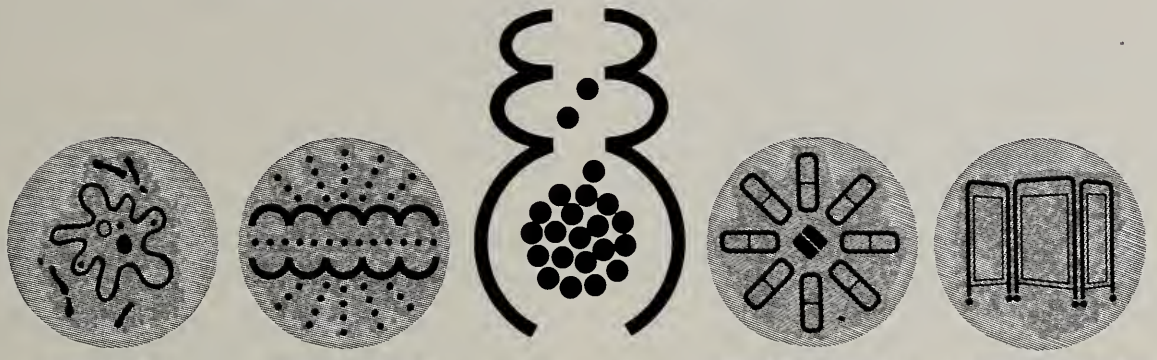
This is the Fifth Edition of the book by Markowitz, Archibald and Downie on experimental surgery, and is undoubtedly the best book on experimental surgery available in the American literature today. It has been modernized, brought up to date, and covers the classical experimental approaches to abdominal surgery, thoracic surgery; it has also introduced chapters on the latest subjects such as heart-lung perfusions, tissue transplantation, and the latest experimental techniques in advanced cancer surgery. This book will be particularly valuable for those engaged in experimental surgery, for the research laboratories of every hospital, and for the surgeons actively engaged in research work. It will be of relatively little value to the practicing surgeon who has no interest in current surgical research. The latter would be better advised to read the current journals, and to avail himself of the current texts in surgery, but for those who have an experimental bent no book will be more satisfying or valuable than this latest edition of Experimental Surgery by Markowitz, Archibald and Downie. It is highly recommended as a book on experimental surgery.

V. RICHARDS, M.D.

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The relatively few conditions in which Lomotil has given less than satisfactory control have been, for the most part, those such as severe ulcerative colitis in which too little anatomic or functional capacity of the intestines remains for the motility-lowering action of Lomotil to have effect.

It should be noted, however, that Lomotil has proved highly useful in mild to moderate ulcerative colitis and in several other refractory forms of diarrhea.

The recommended initial adult dosage is two tablets (2.5 mg. each) three or four times daily, reduced to meet the requirements of each patient as soon as the diarrhea is controlled. Maintenance dosage may be as low as two tablets daily. *Children's* daily dosage (in divided doses) varies from 3 mg. for a child of 3 to 6 months to 10 mg. for one 8 to 12 years of age. Lomotil is an exempt narcotic; its abuse liability is low and comparable to that of codeine. Recommended dosages should not be exceeded. Side effects are relatively uncommon but among those reported are gastrointestinal irritation, sedation, dizziness, cutaneous manifestations, restlessness and insomnia. Lomotil should be used with caution in patients with impaired liver function and in patients taking addicting drugs or barbiturates. Lomotil is a brand of diphenoxylate hydrochloride with atropine sulfate; the subtherapeutic amount of atropine is added to discourage deliberate overdosage.

Research in the Service of Medicine SEARLE

National Conference Scheduled On Driver Safety

A National Conference on Medical Aspects of Driver Safety and Driver Licensing will be held in Chicago, Nov. 16-18, 1964.

More than three years in the planning, the conference will be sponsored by the American Medical Association, the American Association of Motor Vehicle Administrators, and the U.S. Public Health Service.

It will bring together for workshop sessions about 200 of the nation's leaders in the fields of medicine, public health, driver licensing, research and others concerned with the medical qualifications of drivers.

The conference is expected to contribute materially toward a better understanding of the interrelationship between the mental and physical condition of a person and his ability to drive. There is also reason to believe that it will point out research needs and priority recommendations in the important area of human factors which affects driving safety.

There are about 91 million persons licensed to drive motor vehicles in the United States. More than 40,000 are killed in motor vehicle accidents annually. Injuries, disfigurements, and permanent impairments range in the millions.

The Department of Health, Education and Welfare was asked to sponsor a conference of this nature in 1960 by the Association of State and Territorial Health Officers.

Some state legislatures have given serious consideration to the enactment of laws and regulations that would require certain medical evaluations for all drivers, or for selected categories of drivers, in connection with the granting of licenses.

The AMA has been deeply concerned about the possible impact of such legislation, both upon drivers and physicians. In December, 1963, the AMA Committee on Medical Aspects of Automotive Safety drafted a statement on the medical aspects of driver limitation which pointed out the problems involved if medical examinations were to be required initially and periodically for *all* drivers.

At the same time, the statement recognized that in some general medical problem areas, there was need for evaluation of "driver limitation."

Hardening of Cerebral Arteries Not Caused by Aging

Aging accompanies hardening of the cerebral arteries but is not a causal factor in this degenerative process, Drs. J. A. Resch and A. B. Baker, Minneapolis, stated.

Their conclusion was drawn from a study of atherosclerosis within the circle of Willis based on 3,839

(Continued on Page 44)



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Hardening of Cerebral Arteries Not Caused by Aging

(Continued from Page 34)

autopsies. A preliminary report on the study appears in the June *Archives of Neurology*, published by the American Medical Association.

Within the brain, true atherosclerotic changes are found chiefly along the vessels of the circle of Willis and the changes, even in the earliest stages, are visible to the naked eye, the authors explained.

The study revealed a correlation between age of the patient and atherosclerotic changes, where parts of the artery lining have thickened because of deposits of fat or other material.

"There can be no question that atherosclerosis gradually increases in the cerebral arteries with age," the physicians said. "This is particularly true of the more severe degenerative lesions.

"However, it is readily apparent that age alone is not specifically related to this process.

"In our series, the atherosclerotic process was first apparent in the second decade of life where five per cent of the cases showed some vascular changes. Our youngest patient was 14 years of age. Moreover, four per cent of our patients in the ninth and tenth decades of life showed no grossly visible atherosclerotic changes.

"These observations would suggest that age alone is not specifically related to this process but rather that atherosclerosis is a chronic degenerative disease of blood vessels requiring years for its development and in which many factors no doubt play an etiologic role. It appears more commonly in older individuals where the causative factors have ample time to produce the changes.

"Age, therefore, would be an accompanying factor rather than an etiologic agent in this degenerative process."

The study also revealed sex differences in the occurrence of atherosclerosis.

Cerebral atherosclerosis is less common in younger women than in men of the same age groups, the researchers reported.

This was particularly true in women between 40 and 60 who had from 11 to 19 per cent less atherosclerosis than men of the same age. Beyond the age of 60, the two sexes showed very little difference.

"From our present studies, it would appear that there probably is a sex difference in cerebral atherosclerosis and that this degenerative process is represented in women in the younger age groups in whom estrogenic activity is active," the authors concluded.

When a larger series of autopsies have been completed, the question of sex differences and the possible importance of estrogens, the female sex hormone, in cerebral atherosclerosis may finally be settled, they added.

The authors are affiliated with the University of Minnesota Medical School.



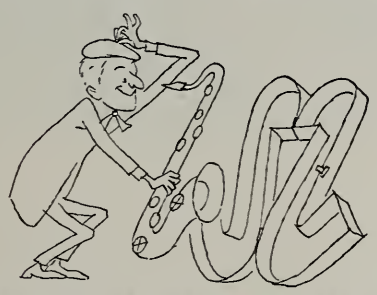
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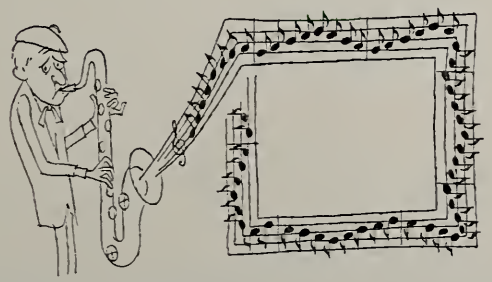
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*Scal, J. C.: Eye Ear Nose & Throat Month. **38**:738 (Sept.) 1959.

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MALLEOLO-STAPEDIAL TRANSPOSITION IN MIDDLE EAR SURGERY —M. Rubinstein (Tel-Hashomer Hosp., Tel-Hashomer, Israel), E. Korine, and A. Eviatar. Arch. Otolaryng. 80:38 (July) 1964.

Forty cases of chronic otitis media were operated on by the Malleolo-Stapedial transposition technique. The non-functioning incus was removed, and new contact between the malleus and stapes was established. In 35 cases, the hearing was improved, with an average gain of 26 decibels. The results remained unchanged during the two years' follow-up. The preoperative ear infection was controlled, and no labyrinthine damage occurred among the cases presented. According to the results obtained, the malleolo-stapedial transposition technique is considered a safe, reliable procedure in the surgery of middle ear diseases.

* * *

COMPARATIVE STUDY OF FOUR METHODS OF DETERMINING ALKALINE PHOSPHATASE—J. J. Deren et al. (19 Barry St, Randolph, Mass.). New Eng. J. Med. 270:1277 (June 11) 1964.

The Bodansky, King-Armstrong, Bessey-Lowry, and Klein assay systems for serum alkaline phosphatase were evaluated. The 95% confidence limit of the determination calculated from double-blind duplicate determinations for the first three methods ranged from 50% greater to 33% lower than the obtained value. The Klein variability was greater, especially at low values. The first three methods were also linearly related to each other over a wide range of phosphatase activity. The Klein method showed a fall-off when sera with high alkaline levels were studied. The four methods were equally sensitive in detecting a wide variety of clinical disease entities.

* * *

ASSOCIATION OF BLOOD GROUPS AND CERTAIN EYE DISEASES—H. Reed (210 Oak St., Winnipeg, Man.) and S. Platts. Canad. Med. Assoc. J. 90:1352 (June 13) 1964.

The blood of patients suffering from cataracts, glaucoma, and strabismus was grouped and compared with the distribution of blood groups in volunteers at blood donor clinics. It was found that there was no significant statistical difference between the distribution of groups in patients and controls.

* * *

AN APPARATUS FOR TRACHEOSTOMY CARE—R. E. Rhodes, Jr. (Mayo Clinic, Rochester, Minn.) and J. C. Lillie. Arch. Otolaryng. 80:93 (July) 1964.

Care after tracheostomy has always been a subject of concern. Various methods, instruments, and techniques have evolved in an effort to solve this problem. A physiological, simple apparatus that is clinically and economically practical to help in this care is described. It was readily accepted and used by the nursing staff at the Mayo Clinic and its affiliated hospitals for a number of years. Such problems as the provision of a moist atmosphere, prevention of encrustations, and care of the cannula are considered, and the problems of iatrogenic trauma and infection, the prime stimuli for the genesis of this apparatus, are much reduced by use of this apparatus.

* * *

THE WPW SYNDROME IN CHILDHOOD—K. Nitsch (Leisewitzstr. 51, Hannover, Germany). Paediat. Prax. 3:195 (No. 2) 1964.

The Wolff-Parkinson-White (WPW) syndrome is characterized by electrocardiographic changes which occur frequently in childhood; the diagnosis is often missed. On the basis of the author's own observations as well as by four illustrated cases presented in the article it was confirmed that

(Continued on Page 60)



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REFERENCES AND REVIEWS

(Continued from Page 58)

the WPW syndrome has no uniform pathogenesis. Sometimes a correlation between inflammatory or degenerative diseases and the WPW syndrome can be established. The diagnosis is facilitated by the use of certain drugs and by influences exerted on the autonomic nervous system (Vasalva's test, standing-up and functional trials, carotid sinus and bulbus oculi pressure tests). Therapy is dependent upon the etiology of the syndrome. Paroxysmal tachycardia is a dreaded, life-threatening complication which is usually of supraventricular origin. It occurs even in patients in whom no organic cardiac changes are presumed. After an initial attack, prophylactic medication is urgently recommended.

* * *

Stability of Labeled Aortic Elastic Tissue With Age and Pregnancy in the Rat—R. L. Walford (Department of Pathology, University of California, Los Angeles), P. K. Carter, and R. B. Schneider. Arch. Path. 78:43 (July) 1964.

An analysis of the radioactivity of elastin isolated from aortas of rats injected with glycine labeled with radioactive carbon 14 at three weeks of age was done throughout their entire life spans (930 days). The long-term turnover of labeled elastin was nil. Induction of pregnancy in rats did not alter this situation.

* * *

Tissue "Snowplowing": A Post-Tracheotomy Complication—G. H. Decancq, Jr. (Northside Division, Rochester General Hosp., Rochester, N.Y.). Amer. J. Dis. Child. 108:94 (July) 1964.

Post-tracheotomy obstructive phenomena are many and varied. Often the etiology is obscure, delayed definitive action, and results in serious complications or death. The result of the "snowplowing" effect may be the common denominator which explains a variety of difficulties after tracheotomy.

* * *

Ethical Problems in Organ Transplantation—M. F. A. Woodruff. Brit. Med. J. 1:1457 (June 6) 1964.

The author discusses the ethical problems relating to the transplantation of whole kidneys and other organs from living donors and also from cadavers.

* * *

Facial Diplegia—A Viral Disease?—A. Schuring and W. H. Saunders (410 W. Tenth St., Columbus, Ohio). Arch. Otolaryng. 80:103 (July) 1964.

Bilateral facial paralysis is described in a 20-year-old girl. The history, symptoms, and course of the paralysis which is not associated with any other neurological abnormality suggest that one of the causes of facial diplegia may be a virus infection.

* * *

Electronic Particle Counting Applied to Quantitative Study of Red Cell Agglutination—A. J. Bowdler and S. N. Swisher (260 Crittenden Blvd., Rochester, N.Y.). Transfusion, 4:153 (May-June) 1964.

The Coulter model B electronic particle counter was used for quantitation of red cell agglutination by counting free cells in agglutinated samples. Two methods developed: (1) agglutinates overlapping red cells in size were included in counts, (2) only red cells smaller in size than agglutinates were counted. Suitable corrections gave total free cell content in both cases with corresponding results. The method is shown to be applicable to agglutination assays and to the study of aggregation patterns of red cells.

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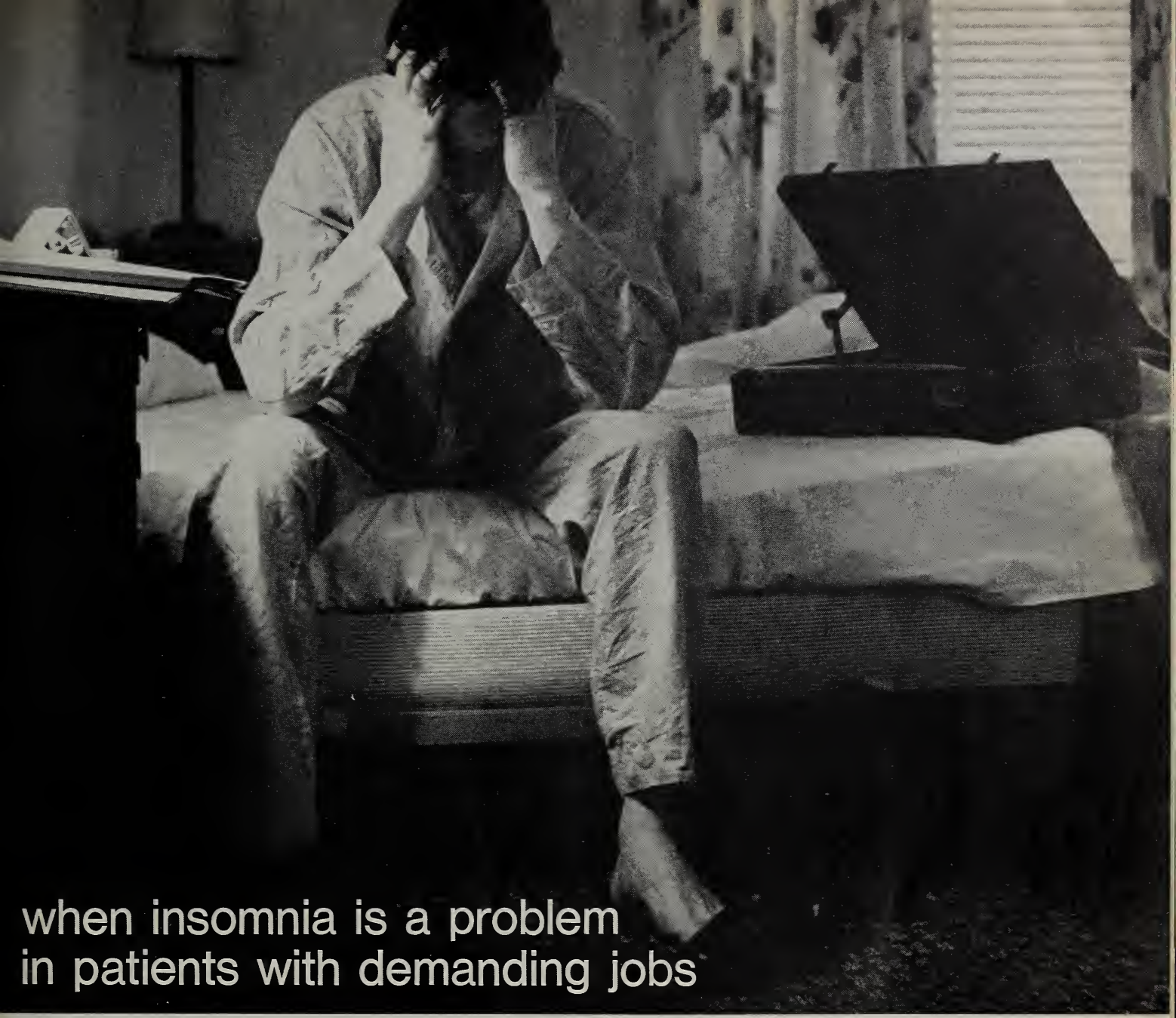
References—Should conform to the following order: name of author, title of article, name of periodical, with volume, page, month, day of the month if weekly, and year—i.e.: Lee, G. S.: The heart rhythm following therapy with digitalis, Arch. Int. Med., 44:554, Dec. 1942. They should be listed in alphabetical order and numbered in sequence.

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Los Angeles.....107 South Broadway 90012
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955 South Western Ave., Los Angeles 90006
Associate Executive Secretary.....E. E. Salisbury
693 Sutter Street, San Francisco 94102
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415 474-1061
Los Angeles.....955 South Western Ave. 90006
213 731-6397

Department of Public Health of the State of California

Director.....Malcolm H. Merrill, M.D.
2151 Berkeley Way, Berkeley 94704
Berkeley.....2151 Berkeley Way 94704
415 843-7900
Sacramento.....631 J Street 95814
916 442-4711
Los Angeles.....703 State Building 90012
213 620-2900

Medical Schools in California

University of California School of Medicine, Medical Center, San Francisco 94122. Dean: William O. Reinhardt, M.D.

Stanford University School of Medicine, 300 Pasteur Drive, Palo Alto 94304. Acting Dean: Sidney Raffel, M.D.

University of Southern California School of Medicine, 2025 Zonal Avenue, Los Angeles 90033. Dean: Roger O. Egeberg, M.D.

Loma Linda University, School of Medicine, 1720 Brooklyn Avenue, Los Angeles 90033. Dean: David Burdg Hinshaw, M.D.

University of California at Los Angeles, School of Medicine, Hilgard Avenue, Los Angeles 90024. Dean: Sherman M. Mellinkoff, M.D.

California College of Medicine: 1721 Griffin Avenue, Los Angeles 90031. Dean: Warren L. Bostick, M.D.

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6230 Claremont Ave., Oakland 94618
J. Brandon Bassett.....Secretary
2930 McClure St., Oakland 94609

BUTTE-GLENN Medical Society, P. O. Box 1008, Chico 95927. Meets Fourth Thursday.
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170 E. 2nd Ave., Chico 95926
Dale W. Ritter.....Secretary
6 Cohasset Circle, Chico 95926

FORTY FIRST Medical Society, 4775 Santa Monica Blvd., Los Angeles 90029.
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11230 Magnolia Blvd., No. Hollywood 91601
Glenn F. Gordon.....Secretary
1630 Del Valle Ave., Glendale 91208

FRESNO County Medical Society, 2155 Amador, Fresno 93721. Meets Second Tuesday, 6:30 p.m., Sunnyside Country Club.
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1223 Wishon Ave., Fresno 93728
Joseph B. Ford, Jr. Secretary
2940 Fresno St., Fresno 93721

HUMBOLDT-DEL NORTE County Medical Society. Meets Second Thursday.
Robert Devine.....President
730 7th St., Eureka 95501
Wells Carey.....Secretary
2822 E St., Eureka 95501

IMPERIAL County Medical Society. Meets Second Tuesday, 8 p.m., Pioneer Memorial Hospital, Brawley.
Nathan Wolf.....President
126 Main St., Brawley 92227
Ernest Brock Secretary
200 S. Imperial Ave., Imperial 92251

INYO-MONO County Medical Society. Meets Fourth Tuesday except December, January, February.
D. L. Christenson.....President
380 N. Mt. Whitney Dr., Lone Pine 93545
W. Ray Hartwig.....Secretary
459 West Line, Bishop 93514

KERN County Medical Society, 2603 G Street, Bakersfield 93301. Meets Third Tuesday, 7:30 p.m., Society Office, 2603 G Street, except June, July, August.
Hans E. Einstein.....President
2441 "G" St., Bakersfield 93301
Keith W. Spaulding.....Secretary
2521 "G" St., Bakersfield 93301

KINGS County Medical Society. Meets Second Thursday, 7:00 p.m. Place to be announced.
Clyde Ball.....President
1320 Whitley Ave., Corcoran 93212
Edwin E. Kerr.....Secretary
208 N. Douty St., Hanford 93230

LASSEN-PLUMAS-MODOC-SIERRA County Medical Society. Meets on call.
Lloyd Shannon.....President
P. O. Box 963, Alturas 96101
Robert C. Haggard.....Secretary
Box 426, Loyalton 96118

LOS ANGELES County Medical Assn., 1925 Wilshire Blvd., Los Angeles 90057.
Elmer F. Gooel.....President
1925 Wilshire Blvd., Los Angeles 90057
George C. Andersen.....Secretary
1925 Wilshire Blvd., Los Angeles 90057

MARIN Medical Society, 1601 Second St., Suite 106, San Rafael 94901. Meets First Thursday, 7:00 p.m.
Calvin Plumhof.....President
711 D St., San Rafael 94901
John McGee Secretary
712 D St., San Rafael 94901

MENDOCINO-LAKE County Medical Society.
Thomas Nicholson.....President
408 W. Perkins St., Ukiah 95482
Patrick R. Allanson.....Secretary
728 S. State St., Ukiah 95482

MERCED County Medical Society. Meets Fourth Thursday, Hotel Tioga, Merced.
James A. Parker.....President
535 W. 26th St., Merced 95340
Patrick J. Maloney.....Secretary
656 W. 20th St., Merced 95340

MONTEREY County Medical Society, P. O. Box 308, Salinas 93903. Meets First Thursday.
Osman H. Hull.....President
716 Cass St., Monterey 93940
Joseph E. Turner.....Secretary
1073 Cass St., Monterey 93940

NAPA County Medical Society. Meets Second Wednesday, P. O. Box 658, Napa 94559
E. Paul White, Jr. President
P. O. Box 658, Napa 94559
Richard Clark.....Secretary
1054 Beard Rd., Napa 94558

ORANGE County Medical Association, 300 S. Flower, Orange 92666. Meets First Tuesday, 7:00 p.m.
Hugh J. Plumb, Jr. President
1901 Westcliff Dr., Newport Beach 92663
Laurance A. Mosier.....Secretary
10510 Chapman St., Garden Grove 92640

PLACER-NEVADA County Medical Society. Meets Second Wednesday.
Clifford W. Wauters.....President
701 High St., Auburn 95603
Arthur R. Weaver.....Secretary
701 High St., Auburn 95603

RIVERSIDE County Medical Association, 4175 Brockton Ave., Riverside 92501. Meets Second Monday, 7:30 p.m., Spanish Arts Gallery, Mission Inn.
Donald P. Carpenter.....President
3660 Arlington Ave., Riverside 92506
Richard W. Trotter.....Secretary
6876 Magnolia Ave., Riverside 92506

SACRAMENTO Society for Medical Improvement, 5380 Elvas Ave., Sacramento 95819. Meets Third Tuesday, 8:30 p.m., Sutter Hospital Auditorium.
L. Morgan Boyers.....President
2615 Eye St., Sacramento 95816
James W. Martin.....Secretary
2811 L Street, Sacramento 95816

SAN BENITO County Medical Society. Meets once a month, except July and August. Time and place to be announced.
Kent S. Taylor.....President
345 5th St., Hollister 95023
Robert D. Quinn.....Secretary
535 Monterey St., Hollister 95023

SAN BERNARDINO County Medical Society, 1875 N. D St., San Bernardino 92405. Meets First Tuesday, 7:30 p.m., Harold's Club, Fontana.
Merlin A. Hendrickson.....President
238 N. Riverside Ave., Rialto 92376
Nicholas P. Krikes.....Secretary
25060 Base Line, San Bernardino 92410

SAN DIEGO County Medical Society, 3427 - 4th Ave., San Diego 92103. Meets Second Tuesday. Location of meetings varies.
Walter R. Nickel.....President
233 A St., San Diego 92101
Purvis L. Martin.....Secretary
2105 5th Ave., San Diego 92101

SAN FRANCISCO Medical Society, 250 Masonic Ave., San Francisco 94118.
John B. Schaupp.....President
250 Masonic Ave., San Francisco 94118
George K. Herzog, Jr.....Secretary
250 Masonic Ave., San Francisco 94118

SAN JOAQUIN County Medical Society. Meets First Thursday, 8:15 p.m., 445 W. Acacia St., P. O. Box 230, Stockton 95201.
David Leon Green, Jr.....President
2633 Pacific Ave., Stockton 95204
Dora A. Lee.....Secretary
2420 N. California St., Stockton 95204

SAN LUIS OBISPO County Medical Society. Meets Third Saturday, 7:00 p.m., Anderson Hotel, San Luis Obispo 93402.
Richard W. Eells.....President
743 Pismo St., San Luis Obispo 93401
Richard W. Cletsoway.....Secretary
705 Grand Ave., San Luis Obispo 93402

SAN MATEO County Medical Society, 122 El Camino Real, San Mateo 94401. Meets Third Tuesday.
Ward L. Hart.....President
100 Laurel Ave., San Carlos 94401
Howard W. Lindsey.....Secretary
323 N. San Mateo Dr., San Mateo 94401

SANTA BARBARA County Medical Society, 300 W. Pueblo St., Santa Barbara 93105. Meets Second Monday of the month, University Club, 1332 Santa Barbara St., Santa Barbara.
H. L. Stewart, Jr.....President
300 W. Pueblo St., Santa Barbara 93105
Thurman K. Hill.....Secretary
300 W. Pueblo St., Santa Barbara 93105

SANTA CLARA County Medical Society, 700 Empey Way, San Jose 95128. Meets First Monday.
S. Fred Kaufman.....President
700 Empey Way, San Jose 95128
Jacob M. Stone.....Secretary
700 Empey Way, San Jose 95128

SANTA CRUZ County Medical Society. Meets every Second Month, Second Tuesday. Time, place to be announced.
F. H. Koepke.....President
850 Main St., Watsonville 95076
John W. Morris.....Secretary
230 Walnut Ave., Santa Cruz 95060

SHASTA-TRINITY County Medical Society. Meets Second Monday of the month. Place to be announced.
Michael J. Hamilton.....President
1348 Market St., Redding 96001
Robert G. Taylor.....Secretary
1308 Court St., Redding 96001

SISKIYOU County Medical Society. Meets Sunday on call.
William D. Schnack.....President
8 Main St., Weed 94096
Rand Apgood.....Secretary
Medical Center Building, Yreka 96097

SOLANO County Medical Society. Meets Second Tuesday, 8:00 p.m., at different meeting places.
R. Matthew Gibbons.....President
1200 Marin St., Vallejo 94590
John C. Miller.....Secretary
410 Tennessee St., Vallejo 94590

SONOMA County Medical Society, 576 B Street, Santa Rosa 95401. Meets Second Thursday.
A. A. Thurlow, Jr. President
185 Sotoyome St., Santa Rosa 95405
Tetsuro Fujii.....Secretary
1667 Bloomfield Rd., Sebastopol 95472

STANISLAUS County Medical Society, 303 Downey Ave., Modesto. Meets Third Tuesday of the month, 7 p.m., Hotel Covell, Modesto 95354.
John S. Woolley.....President
808 13th St., Modesto 95354
Jeanne I. Miller.....Secretary
709 - 18th St., Modesto 95354

TEHAMA County Medical Society. Meets at call of President.
Harve Jourdan President
343 Oak St., Red Bluff 96080
William L. Weirich.....Secretary
210 S. Main St., Red Bluff 96080

TULARE County Medical Society, 1640 West Mineral King, P. O. Box 16, Visalia 93278.
James W. Goettle.....President
424 E. Tulare Ave., Tulare 93274
Philip S. Barber.....Secretary
P. O. Box 16, Visalia 93278

VENTURA County Medical Society. Meets Second Tuesday each month, 7:30 p.m., Los Posas Country Club, Camarillo.
Henry J. Rulfo.....President
302 Glen Ellen Dr., Ventura 93003
F. K. Helbling.....Secretary
3081 Loma Vista Rd., Ventura 93003

YOLO County Medical Society. Meets First Wednesday.
Spencer T. Chester.....President
Woodland Clinic, Woodland 95675
Samuel C. Houston.....Secretary
3 Court St., Woodland 95695

YUBA-SUTTER-COLUSA County Medical Society, 370 Del Norte Ave., Yuba City 95991. Meets Second Tuesday.
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725 4th St., Marysville 95901
Norman K. Noordhoff.....Secretary
320 G St., Marysville 95901

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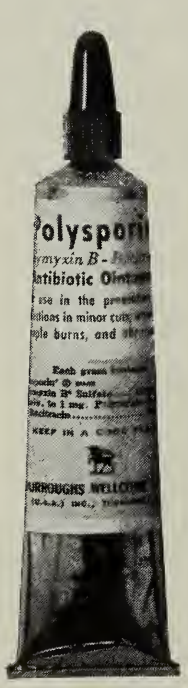
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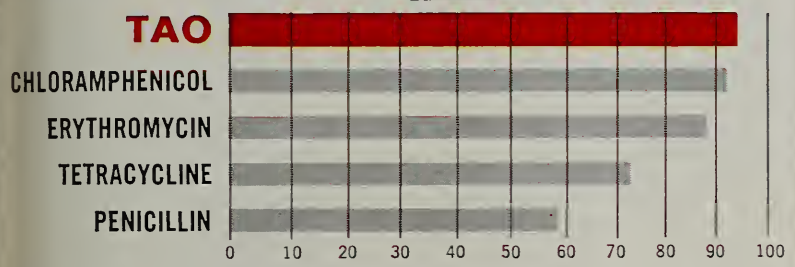
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...and confirmed in clinical practice.[2] Of 129 patients with upper or lower respiratory infections treated with TAO, 120 had a good response. A "good" response generally showed reduction in temperature and toxicity within 48 hours after initiation of therapy, with subsequent clinical and bacteriological cure of infection.

Indications: The bacterial spectrum includes: streptococci, staphylococci, pneumococci and gonococci. Recommended for acute, severe infections where adequate sensitivity testing has demonstrated susceptibility to this antibiotic and resistance to less toxic agents. Not recommended for prophylaxis or in the treatment of infectious processes which may require more than ten days continuous therapy. In view of the possible hepatotoxicity of this drug when therapy beyond ten days proves necessary, other less toxic agents, of course, should be used. If clinical judgment dictates continuation of therapy for longer periods, serial monitoring of liver profile is recommended, and the drug should be discontinued at the first evidence of any form of liver abnormality.

Contraindications and Precautions: TAO (triacetyloleandomycin) is contraindicated in pre-existing liver disease or dysfunction, and in individuals who have shown hypersensitivity to the drug. Although reactions of an allergic nature are infrequent and seldom severe, those of the anaphylactoid type have occurred on rare occasions. Based upon the usage of this drug, the evidence of jaundice, considering all reports available to J. B. Roerig and Company referable to this effect is 5.5 per million courses of therapy. When only those which definitely can be related to this drug are equated to usage, the incidence is 1.6 per million courses of treatment.

References: 1. Isenberg Henry D., Ph.D.: "A Comparison of Nationwide Microbial Susceptibility Testing Using Standardized Discs," Health Laboratory Science, I:1-72 (July) 1964. 2. Shubin, H. et al: Antibiotic Med. and Clin. Ther. 6:156 (Mar.) 1959.

†Based on the following number of cultures: staphylococcus aureus (coagulase positive), 5,440; diplococcus pneumoniae, 1,130; streptococcus pyogenes (β-hemolytic), 1,519; streptococcus pyogenes Group D (enterococcus), 1,242.

††Based on the following number of cultures: staphylococcus aureus (coagulase positive), 1,023; diplococcus pneumoniae, 134; streptococcus pyogenes (β-hemolytic), 455; streptococcus pyogenes Group D (enterococcus), 134.

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Occupational Health Congress Set for Houston This Month

The 24th annual Congress on Occupational Health will be held in Houston, September 26-27. Sponsored by the American Medical Association on Occupational Health, the two-day meeting will be held at the Rice Hotel.

"Only a small percentage of Americans work in large industries where employees benefit from good medical departments with full-time medical and auxiliary personnel," according to an editorial in the August 3 *Journal of the AMA*. "For the remaining 90 per cent of the population working in small factories or shops, or privately employed, occupational health programs are inadequate or nonexistent."

The AMA congress is designed to familiarize physicians with particular health hazards inherent in a patient's occupation.

Saturday morning's opening session will be devoted to a discussion of "Cardiology in Industry." Physician participants include George Burch, chairman, Department of Medicine, Tulane University School of Medicine; Frederick Stare, professor of Nutrition, Harvard University School of Public Health; John Moyer, professor and chairman, Department of Medicine, Hahnemann Medical College and Hospital; Raymond Pruitt, professor and chairman, Department of Internal Medicine, Baylor University.

Immediately preceding the noon recess, the 1963 Physician's Award of the President's Committee on Employment of the Handicapped will be presented to John S. Young, M.D., Denver, for his outstanding work in the employment of the handicapped.

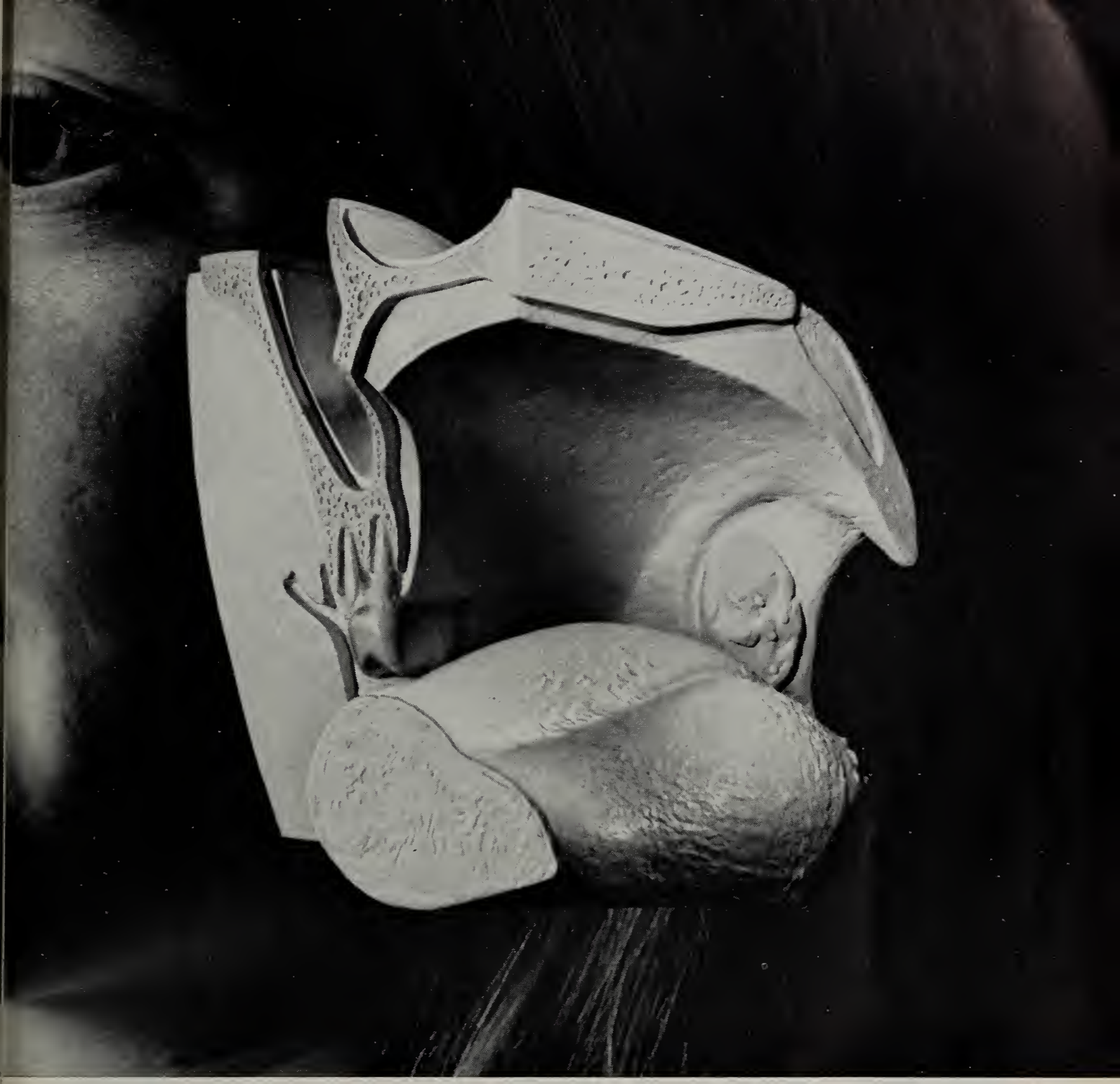
The conferees will tour the new NASA Manned Spacecraft Center Saturday afternoon and will be told of the progress in America's Gemini and Apollo space programs. An astronaut will address the gathering.

A symposium on "Treatment of Burns" will open the Sunday morning program. Participants will include members of the Department of Surgery at the University of Texas.

The morning session will close with a three-point discussion of "Problems of General Physicians." Topics include "Investigation and Medical Testimony on Death from Doubtful Causes," "The Nurse Who Works Alone," and "A General Practice Plan for Periodic Health Examinations in Very Small Employee Groups."

Pesticide poisoning, toxic exposures and health programs for radiation workers will be the subjects covered in a Sunday afternoon symposium entitled "Environmental Health Services."

The concluding session will be devoted to discussion of the practical expectations for rehabilitation of the severely impaired person, with case presentations from Baylor University.



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Special Pressure Suit Aids Low Blood Pressure Patient

An elastic garment has been used successfully to treat a 69-year-old woman subject to fainting when standing because of low blood pressure.

There previously has been no successful management of this syndrome, according to Drs. Joel M. Levin, Paul Ravenna and Morris Weiss, Michael Reese Hospital and Medical Center, Chicago, who described the counterpressure suit in the July *Archives of Internal Medicine*, published by the American Medical Association.

The custom-fitted, commercially available garment is one piece, stretching from the waist to the toes. It provides maximum pressure at the ankles which gradually decreases to the top, according to the report.

Ordinary clothes can be worn over the garment which is made of a porous elastic mesh and is comfortable in warm weather.

While wearing the garment, the patient is able to walk around and is not housebound, the physicians reported. Since the garment has been used, they said, drug therapy has been discontinued.

The authors termed the garment an important contribution in the control of postural hypotension. Various drugs and physical means have been tried previously to control the syndrome but have proved to be either ineffective or poorly tolerated by the patient, they pointed out.

Heart Death Rate Unaffected By Altitude in Colorado

Altitude was found to be unrelated to the death rate from heart disease caused by hardening of the arteries or high blood pressure in Colorado, three Denver researchers reported.

Because of the apparent rarity of fatal cases of coronary thrombosis and hypertension at higher elevations observed by practicing physicians in Colorado and Peru, Colorado mortality statistics for these causes for the years 1949-1951 and 1959-1961 were analyzed for variation by altitude, William E. Morton, M.D., Donald J. Davids, M.P.H., and John A. Lichty, M.D., reported.

The age-adjusted mortality rate for arteriosclerotic heart disease shows no consistent variation by altitude, the authors wrote in the July *Archives of Environmental Health*, published by the American Medical Association. Neither did the age-adjusted mortality rate for hypertension and hypertensive heart disease show any consistent variation related to altitude, they said.

The data do not substantiate the belief that fatal arteriosclerotic heart disease or hypertension are less apt to occur among residents at higher elevations, they concluded.



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1. Dorfman, W., and Johnson, D.: *Overweight Is Curable*, New York, The Macmillan Company, 1948, p. 16.

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No Harm Reported Due to Smoke From Charcoal Broiling

No ill effects resulting from charcoal-broiled food have been reported in man, according to Dr. Philip L. White, Sc. D., secretary of the American Medical Association Council on Foods and Nutrition.

The smoke which arises when drippings hit live charcoal used in outdoor grills is primarily from incompletely combusted fat, Dr. White explained in the August *Today's Health* magazine, published by the AMA.

"It is called thermal decomposition because fats begin to break down at temperatures under those required for ignition," he said.

"The same thing happens when frying fat begins to smoke when overheated.

"It has been shown that fat, which is partially decomposed by heat, produces substances suspected of being hazardous. However, no incidences of harm traceable to food have been reported in man. For that matter, reserach with appropriate animals likewise has failed to demonstrate any hazard."

To assure a more pleasant atmosphere when barbecuing, Dr. White said it is well to avoid the possibility of fat combustion as much as possible.

"The National Live Stock and Meat Board recommends that meat be cooked by the heat from the coals, not by fire," he pointed out.

"Any fires should be quickly extinquished by water. Coals should be spaced so that no two touch and adequate room is provided for fat to drip without coming into contact with the coals. Ideally, a drip pan should be used."

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James G. Telfer, M.D. Named to AMA Post

James G. Telfer, M.D., M.P.H., has been named assistant director of the American Medical Association Department of Environmental Health and secretary of the AMA Committee on Blood.

Dr. Telfer began his AMA duties in July after retiring as chief of the United States Public Health Service Division of Foreign Quarantine. He served 28 years in the Public Health Service.

The 56-year-old physician received his M.D. from Washington University, St. Louis, Mo., and his M.P.H. (Master of Public Health) degree from the University of California at Berkeley. While serving at various U.S.P.H.S. hospitals, he held simultaneous teaching positions as: clinical assistant in medicine and instructor in medicine at Northwestern University, Chicago; instructor in medicine, assistant professor and associate professor of medicine at the University of Texas, Galveston; and, assistant clinical professor of medicine at the University of Washington, Seattle. Dr. Telfer is a Fellow of the American College of Physicians and is certified by the American Board of Internal Medicine.

In addition to service in U.S.P.H.S. hospitals in the U.S., Dr. Telfer served in preventive medicine, quarantine and medical posts in China, Hong Kong, the Philippines, Burma, Panama Canal, Europe, and the U.S. He is currently a member of the World Health Organization's Expert Advisory Panel on International Quarantine.

Dr. Telfer and his wife have nine children, two of whom are junior students at the Washington University School of Medicine.

In his new position, Dr. Telfer will be responsible for administering programs related to blood banking and preventive medicine.

BOOKS RECEIVED

Books received by CALIFORNIA MEDICINE *are acknowledged in this column. Selections will be made for more extensive review in the interest of readers as space permits.*

CARDIAC ARREST AND RESUSCITATION—Second Edition—Hugh E. Stephenson, Jr., B.S., M.D., F.A.C.S., Professor of Surgery, University of Missouri School of Medicine, Columbia, Mo. The C.V. Mosby Company, Saint Louis, 1964. 501 pages, $15.00

CHRISTOPHER'S TEXTBOOK OF SURGERY—Eighth Edition—edited by Loyal Davis, M.D., Professor of Surgery, Northwestern University Medical School. W. B. Saunders Company, Philadelphia and London, 1964. 1481 pages, $18.50.

EARLY TREATMENT OF FACIAL INJURIES—Thomas John Zaydon, M.D., F.A.C.S., Clinical Assistant Professor of Surgery, Plastic Surgery Service, Department of Surgery, University of Miami School of Medicine; Chief, Plastic Surgery Service of St. Francis Hospital, Cedars of Lebanon Hospital, North Miami General Hospital, Miami, Florida; and James Barrett Brown, M.D., F.A.C.S., Professor of Clinical Surgery, Washington University School of Medicine; Professor of Maxillofacial Surgery, Washington University School of Dentistry, St. Louis, Missouri. Lea & Febiger, Washington Square, Philadelphia, 1964. 258 pages, $15.00.

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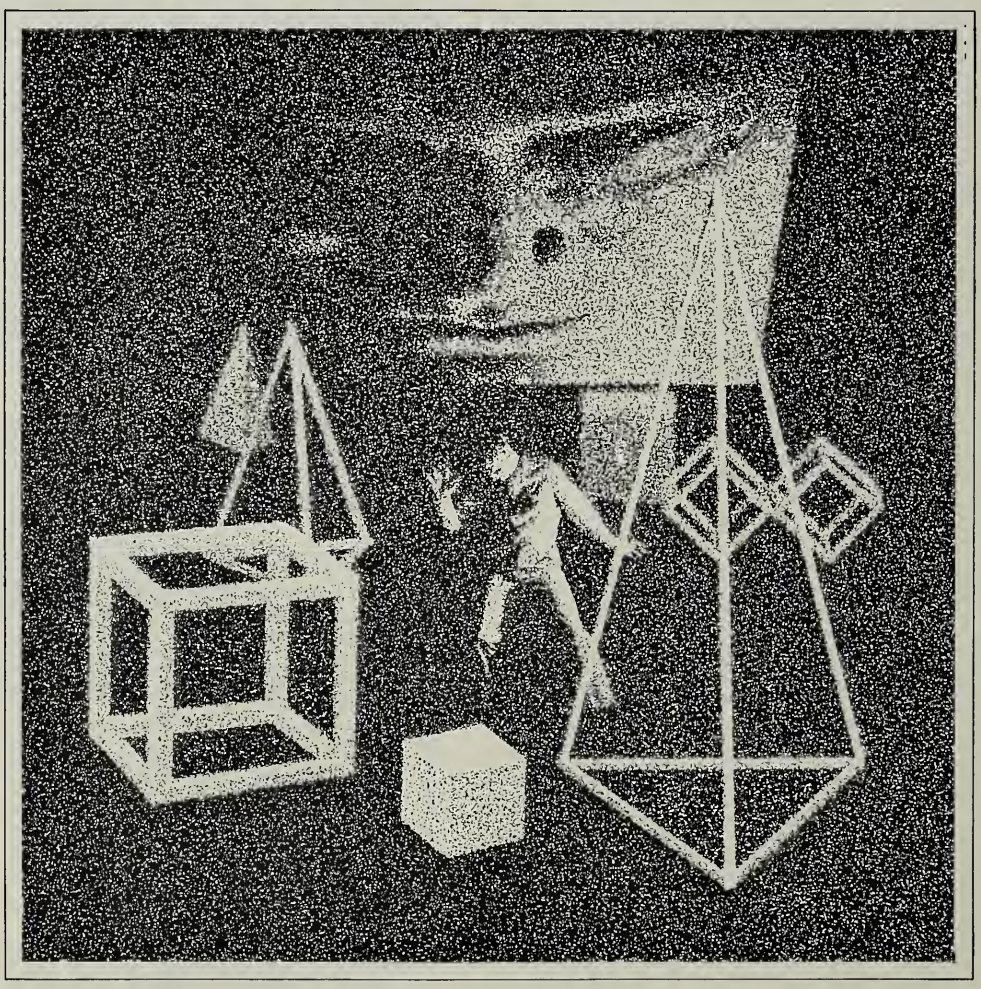
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California Medicine

Current Immunization Methods and Precautions

PAUL F. WEHRLE, M.D., *Los Angeles*

■ *The more commonly used immunizing agents appear to be safe and remarkably effective when administered according to the present routines. The most serious deficiency at the present in the prevention of pertussis, diphtheria, tetanus, smallpox, and measles lies, not in ineffective antigens, but in administration of the present antigens to a larger proportion of the population. It is expected that appropriate sampling techniques will define areas of poor vaccine utilization in many communities. Proper coordination of immunization efforts in each community should result in a more satisfactory level of immunization.*

MORE THAN 20 separate antigens, individually or in numerous combinations, are available for the active immunization of infants, older children and adults. In addition to these, there are ten diseases for which passive antibody in the form of regular or special types of gamma globulin has shown at least some benefit. Since it is impossible to cover each of these in detail, and since much of the information is available for reference in the 1964 Red Book published by the American Academy of Pediatrics[11] and in other sources, this discussion will be limited to common antigens and current practice relating to their use. In addition, some of the special problems of young infants will be recorded and precautions regarding reactions will be discussed.

Presented in part before a Joint Meeting of the Sections on Pediatrics, General Practice, and Preventive Medicine and Public Health at the 93rd Annual Session of the California Medical Association, Los Angeles, March 22-25, 1964.

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Diphtheria, Pertussis and Tetanus

The availability of combined antigens for immunization against diphtheria, and tetanus, (either in the alum precipitated form or as aluminum hydroxide or aluminum phosphate adsorbed antigens) with pertussis vaccine has considerably simplified primary immunization in infants. These antigens are well tolerated when given by deep intramuscular injec-

tion, and either local or systemic complications are unusual. All normal infants two months of age or older should receive three doses of a standard preparation given at monthly intervals. Since there may be variation in antigen concentration between manufacturers, the specific dose recommended by the manufacturer should be used. On completion of this course, the infant will have received a solid basic immunologic experience which should confer a relative immunity to pertussis in at least 85 per cent of them, while the protection against diphtheria and tetanus approaches 100 per cent.

Administration. The preferred site for injection is the lateral thigh muscle near the mid-point. Care should be taken to avoid previous sites of immunization. The deltoid or upper triceps muscle may be used in older children when muscle mass is sufficient. If gluteal injection is used, extreme care must be observed to place the antigen in the upper outer quadrant, since severe sciatic damage has followed careless inoculation in this area. All antigens containing adjuvants must be given by deep intramuscular injection to avoid subcutaneous nodules or sterile abscesses. The skin may be prepared, preferably with iodine followed by alcohol, while standard ABD (antibacterial-detergent solution containing hexachlorophene) solutions with alcohol, or scrupulous scrubbing with 70 per cent alcohol solution alone are alternative methods. It is important to emphasize that good skin preparation will reduce the problems of "sterile" abscess formation.

Reactions. An often overlooked but extremely important detail is careful questioning of the patient or the parent regarding reactions to previous immunizations. It is surprising but true that parents will sometimes neglect to mention serious reactions such as convulsions. If convulsions occurred, then in subsequent injections the pertussis component should be omitted and the diphtheria-tetanus antigens used in reduced dosage. If a severe febrile response resulted, reduced dosage of the original antigen should be adequate to control reactions during the completion of the series. With reduced dosage, one or two additional immunizing doses should be given.

Contraindications. The most important considerations in reviewing contraindications to immunization with these antigens include:

1. Any sign of concurrent significant illness. This is true for any immunizing agent, since it is certain that whatever is given may be blamed for any subsequent illness. It is doubtful that the course of the disease itself will be made worse, but this will be difficult to explain to the parents later. On the other hand, this does not mean that an infant with a mild upper respiratory infection of several days duration should be refused immunization.

2. Evidence of previous cerebral damage, whether in the form of convulsions or of obvious mental deterioration should make one consider a delay in immunization or reduced antigen dose, since convulsions are a problem in this group.

3. Poliomyelitis. Ceasing immunization with DPT antigen during the poliomyelitis season seems no longer necessary due to the extremely low incidence of the disease. However, if at any time in the future poliomyelitis does become epidemic in an area, the known localizing effect and possible provoking effect would suggest that immunization with these agents be deferred until the outbreak is controlled.

4. Encephalopathic reaction. Rarely, severe encephalopathy has been observed following the administration of pertussis vaccine. While the etiological role of the vaccine is not entirely clear, the prudent course is to withhold further pertussis antigen if a reaction of this type is suspected or, as noted previously, if convulsions followed a previous dose.

There is little evidence for the common misconception that if the dose of antigen in the series of three is omitted or delayed, the immunization series should be re-started. Indeed, widely spaced injections may confer superior antibody response.

Booster doses. Boosters, after completion of a series of three basic doses, are given at approximately one year following the initial series, and at four or five-year intervals subsequently. Pertussis antigen should be discontinued after six to eight years of age since the reactions to this antigen may be severe in older children and adults. It is customary to use the adult type of combined diphtheria-tetanus antigen at 12 years of age and above. Caution must be observed in adults since severe reactions to regular diphtheria antigen can occur unless the Maloney test is used to identify hyper-reactors. Since this test is cumbersome and delays the usual routine of a clinic or physician's office, it seems more sensible to utilize the effective adult antigens which have been shown to be well tolerated in adults. These contain less than one-tenth the amount of diphtheria toxoid present in the regular dosage form. While adequate to maintain, or stimulate immunity in adults, the dosage is not high enough for dependable primary response in children.

On exposure to either pertussis or diphtheria, a booster dose of the appropriate antigen is customarily used unless the most recent routine booster or primary series has been completed less than one year previously. Although the fluid antigens may give a slightly more rapid response in terms of antibody measurement,[5] there is as yet no actual clinical demonstration of important differences in protection between the two when given prophylactically. In respect to tetanus, current data would suggest that

a booster dose is adequate for the usual wound prophylaxis for periods up to fifteen years following either the primary series or the most recent booster.[8] With further study of individuals observed for longer periods, perhaps even this interval may be extended. Although between ten and fifteen patients with tetanus are cared for each year on the Communicable Disease Service of Los Angeles General Hospital, we have yet to see tetanus appear in an adequately immunized person. It is interesting that among the patients dealt with, two instances of a second attack of tetanus have been observed, one of which was fatal. This would suggest that only a small amount of toxin is required to produce the disease, and that patients convalescent from tetanus require artificial, active immunization.

Vaccinia

Although it has been suggested that the central nervous system complications of vaccinia are seen more frequently among older individuals vaccinated for the first time and possibly among very young infants, the frequency of this complication is extremely low. In New York City a rate of approximately one in 100,000 was observed,[6] and our experience would indicate that this rate is probably high for this complication.

The problems most frequently encountered with vaccination are as follows: (1) Improper storage of live virus vaccine. Frequently it is forgotten that this virus is a viable agent, and must be treated accordingly. It is supplied in glycerin and will not freeze. Thus, this avoids repeated freezing and thawing which is injurious to virus particles. However, prolonged storage at room temperature is extremely detrimental and only that quantity of vaccine expected to be used within a few hours should be removed from the freezing compartment of the refrigerator where it is customarily stored. If a particular batch of vaccine does not give a high proportion of primary vaccination reactions among susceptible persons, the vaccine should be discarded and a new supply obtained. (2) Improper skin preparation has been responsible for many failures. Either acetone or ether should be used for skin preparation, since alcohol or iodine will often remain on the skin and may inactivate the virus as it is inoculated. (3) Bandages or similar covering should be avoided over the site of vaccination. We have seen numerous, extensive, suppurative lesions, with considerable skin maceration, which developed under such cover.

Precautions.

1. Vaccination should be repeated until an effective primary immunization response has been observed. If the person has been vaccinated previously, attempts to vaccinate should be repeated until a satisfactory immune or accelerated "take" is observed with a batch of vaccine which is known to produce primary responses in previously unvaccinated persons. The reason for the latter consideration is that inactivated vaccine has been shown to produce an immune or accelerated type of skin reaction in persons who have previously experienced a successful vaccination.[2]

2. Each year, we see several cases of generalized vaccinia, usually in persons with eczema. Since it is common knowledge that a child with eczema should not be vaccinated, the virus is usually acquired from a recently vaccinated household contact, unless eczema is of relatively small extent and does not extend beyond the area covered by clothing. Frequently the parents or siblings have eczema, and if they do, the child to be vaccinated must be cared for outside the home for approximately two weeks afterward, perhaps by a grandparent.

Booster doses. Re-vaccination has been advocated for everyone at approximately five-year intervals. Rather than attempting to maintain this ideal schedule for the entire population, it would seem more logical to emphasize the need for immunization among those most likely to be exposed. This would seem particularly desirable for airport workers, customs officials and employees, harbor workers, hospital employees and the like.

Poliomyelitis

Although the control of other communicable diseases has been effective with the immunizing agents available, no disease has been subject to so dramatic a change in incidence within a relatively few years as has poliomyelitis. Indeed, the total number of cases reported will probably be fewer than the deaths from measles for 1964 if present trends continue. In California in 1962 a total of 76 cases of paralytic poliomyelitis was reported; in 1963, 14 cases.[10] In Los Angeles County, the trend was even more dramatic: 42 cases in 1962 and five in 1963. This year is the first year since reporting of paralytic poliomyelitis was begun that a period of several weeks has passed without the report of a single case from the entire United States. As of March 27, 1964, only 13 paralytic cases have been reported from the 50 states. This represents approximately one-third of last year's experience at this time and is the lowest on record.

Two effective approaches toward immunization are available. Inactivated (Salk) vaccine is safe and effective in preventing the paralytic effects of all three polioviruses. In addition, this vaccine has been combined with DPT vaccine to make a quadruple antigen which has been available until recently. Problems in stability of this latter product with

TABLE 1.—*Cases of Landry-Guillain-Barré Syndrome on the Communicable Disease Service, Los Angeles County General Hospital, Before and After Widespread Community Use of Oral Poliovaccine by Vaccine Era.*

Age in Years	Before Community Oral Poliovaccine Jan. 1960-June 1962			After Community Oral Poliovaccine July 1962-Dec. 1963			Total Cases Studied
	Male	Female	Total	Male	Female	Total	
0-10	5	0	5	4(2*)	1(1*)	5	10
10-29	5	3	8	9	6(4*)	15	23
30+	8	0	8	7	2(1*)	9	17
Total	18	3	21	20	9	29	50

*Numbers bracketed with * (total of 8) represent those who actually received oral poliovaccine at any time before onset of present illness. The remaining 21 of the 29 patients did not receive vaccine before illness.

TABLE 2.—*Landry-Guillain-Barré Syndrome in Oral Poliovaccine Recipients by Vaccine Strain Used and Interval Between Administration and Onset of Illness, Source: Communicable Disease Service, Los Angeles County General Hospital, 1962-1963*

Type of Poliovaccine	Interval in Days							
	<6	15	25	35	45	55	75+	Total
Type 1....	0	0	0	1	0	0	0	1
Type 2....	0	1	0	0	1	1	1	4
Type 3....	0	1	0	0	0	1	1	3
Total	0	2	0	1	1	2	2	8*

*Eight of 29 patients hospitalized had received previous Sabin oral poliomyelitis vaccine strains either from private physicians or in community programs.

respect to the pertussis component have made it necessary to shorten the expiration date, which makes marketing more difficult. Thus it is doubtful that this product will continue to be available unless problems of stability are solved. In addition to the inactivated poliovirus antigens, both the single strain and the trivalent oral poliovaccine (live, attenuated-Sabin) are now available and provide advantages in both ease and expense of administration. Also, the increased resistance to intestinal poliovirus infection conferred can be expected to reduce the wild poliovirus strains in the community. It is apparent that the ease of administration of triple oral poliovaccine together with the decrease in problems of record-keeping and confusion over which strain has been administered previously make the trivalent oral vaccine a convenient product for use in physicians' offices. Present trends appear to be toward the use of oral poliovaccines and toward the use of the trivalent rather than the single strains for routine administration. The single strains will probably be preferred for mass programs and for use during epidemic periods.

With respect to safety of the oral poliovaccine, the Los Angeles County experience, carefully scrutinized, of over seven and one-half million doses (2.8 million type I, 2.75 million type II, and 1.99 million type III) did not suggest any harmful effect attributable to the vaccine.[13] A recent review by Canadian authorities of their experience in 1963 has been similarly reassuring.[3] While it is true that a number of cases of paralytic illness have occurred following administration of oral poliovaccine, the conclusions expressed in the Red Book[11] "Critical analysis did not prove that any of the observed illnesses could be attributed to the vaccine virus and their true significance is still under study"—seems a fair statement. In the Los Angeles area, we have observed a number of central nervous system complications of various types, but these have not been related to the use of this vaccine. Our experience with the Landry-Guillain-Barré syndrome is noted in Table 1, by age of patient during the periods before and after the availability of oral vaccine.

In Table 2, it is clear that there is no relationship to type of vaccine, and there is no suggestion of temporal clustering of cases as would be expected with an etiologic relationship. There is no reason to expect oral poliovaccine to prevent all neurological disease. On the other hand, we have no reason to suspect that various neurological problems occur more frequently among those immunized than in the general population, since the proportion of these and other entities occurring in people with a previous history of vaccine administration is approximately that expected to occur in the absence of immunization.

The present recommendation is to administer oral monovalent poliovaccine in single doses of types II, I and III at eight and six-week intervals in the order indicated. A simpler routine, with approximately equal effectiveness, would appear to be the use of the trivalent oral poliovaccine in two doses at approximately eight-week intervals. For older persons immunized for the first time, some physicians may prefer to use the inactivated poliovaccine in three doses, the second administered a month after the first, and the third after an interval of seven months. However, this should be followed by (or replaced with) the use of oral poliovaccine for persons contemplating foreign travel or residing in epidemic areas.

Booster doses. No recommendations are yet available concerning the need for booster doses following the use of oral poliovaccine strains. It would seem prudent, since the "take" rate is not 100 per cent against each of these strains, to administer a single dose of trivalent vaccine, especially to those immunized in infancy, approximately one year following the administration of the last dose of either the single strain or trivalent series. This should be regarded as a "hole filler" rather than a true booster. Since antibody response following inactivated poliovaccine has been less uniform, particularly in the

case of type III antigen, booster doses have been advocated by the American Academy of Pediatrics' Red Book Committee[11] at two-year intervals. Perhaps this is an ultra-conservative approach, but it should be noted that approximately 20 per cent of clinical paralytic poliomyelitis reported in the United States in recent years has occurred in persons who have received three or more doses of inactivated poliovaccine.

Measles

Data on the incidence of measles (rubeola) in the United States and the deaths attributable to this cause are juxtaposed to correspond with data for poliomyelitis in Table 3. It should be noted that underreporting is considerable with measles, and it seems likely that not more than 10 or 15 per cent of cases are reported through the usual channels. It is abundantly clear that measles represents a continuing problem, both in morbidity and in mortality.

Following the isolation of the Edmonton strain of measles virus in tissue culture by Enders and Peebles in 1954, the prospects of measles vaccine became a reality. In 1958, experience was gained with the attenuated strain by Enders, Katz, and others. Subsequently both inactivated and more highly attenuated strains have been subjected to extensive field tests. At present the characteristics of attenuated measles vaccine may be summarized as follows:

1. Provided the individual is at least eight months of age, the administration of attenuated vaccine provides serological evidence of immunity in from 97-100 per cent of recipients.

2. The virus administered is inactivated promptly by antibody acquired from natural infection (whether actively acquired or passively acquired from human gamma globulin if administered before inoculation) but not by antibody stimulated by administration of inactivated measles vaccine.

3. The reactions following the administration of attenuated vaccine have been remarkably mild. Although fever and rash occur, it is abundantly clear that toxicity is minimal and the minor fever is often overlooked by the patient and family alike. With regard to central nervous system reactions, only six reactions of consequence have been reported to date to the USPHS Measles Investigation Unit, Surveillance Section, Communicable Disease Center, Atlanta, Georgia.[7] Two represented acute cerebellar ataxia and are best attributed to other viruses, two represented episodes of aseptic meningitis in patients on our service in Los Angeles, both (on the basis of the serological data) apparently appeared due to mumps. One encephalitic episode was observed elsewhere, but since the patient was already immune to measles, it appears unlikely that measles vaccine played a role in this illness. The sixth illness is impossible to evaluate etiologically, since it represented a renal disease which may occur spontaneously.

TABLE 3.—*Measles and Paralytic Poliomyelitis Cases and Deaths, United States**

Year of Report	Measles†		Paralytic Cases	Poliomyelitis Deaths
	Cases	Deaths		
1952	449,146	618	35,592	3,145
1955	555,156	345	28,985	1,043
1960	441,703	380	3,190	230
1961	423,919	434	1,312	90
1962	481,530	‡	910	—
1963	‡	‡	431	—

*Reported to National Office of Vital Statistics and Communicable Disease Center, U.S.P.H.S.

†Measles case reporting estimated to be 10-15 per cent complete.

‡Data incomplete, probably little change from prior years.

TABLE 4.—*Reactions Following Various Methods of Measles Immunization (Data from Dr. Saul Krugman, et al.)*

Type of Vaccine	Symptomatology		Total Studied
	Fever 103+ (Per Cent)	Rash (Per Cent)	
Edmonton B	30	50	175
Edm. B + gamma globulin (0.01-0.02 ml per lb)	15	12	854
Further attenuated	15	5	569

4. There is an apparent absence of communicability of the attenuated virus which is in sharp contrast to that of the natural infection. There is no evidence that the attenuated vaccine virus is transmissible from an immunized person to his susceptible siblings.

5. There appears to be extremely rapid development of protection beginning with the day of inoculation.

In regard to the different routines available, data from Krugman in Table 4 summarize the frequency of fever and rash following different routines of immunization. It should be pointed out that in addition to the routines noted in the table, either one or two injections of inactivated measles vaccine followed by a dose of attenuated vaccine with injections given at monthly intervals, yield reaction rates (following attenuated) roughly comparable to either the attenuated vaccine plus gamma globulin or the highly attenuated vaccine when used alone. It should also be noted that there is no clear evidence that inactivated vaccine alone will be followed by permanent immunity, but rather that the immunity conferred begins to wane within a relatively few months.[1] The inactivated vaccine should be used alone in pregnancy, leukemia and blood dyscrasias. There is no known contraindication to the use of the inactivated measles vaccine.

Contraindications to the live vaccine presently include (a) age less than 8 or 9 months (b) pregnancy (c) leukemia or blood dyscrasias (d) recent gamma globulin administration (at least two months should elapse), (e) pronounced sensitivity to egg (f) tuberculosis (unless observed carefully) (g) concurrent administration of other live vaccines (until further data are available).

The expense and the cumbersome nature of administration, involving either two or three separate clinic visits or the alternative, two syringes (one with gamma globulin), hamper its ready application to use in the usual public health clinic. However, since measles encephalitis does appear in approximately one case per thousand cases of measles, and since this variety of encephalitis is known to be extremely severe, the use of live vaccine may well be justified even in this situation.

In our experience of well over a hundred cases, measles encephalitis has been associated with a mortality of approximately 10 per cent and about half of the survivors have either motor or intellectual impairment. Indeed, the severity and disability of measles encephalitis is at least that of clinical poliomyelitis. If one includes the secondary bacterial infections of otitis media and pneumonia (where specific treatment is available, but in spite of treatment unfortunate results still occur) the balance in favor of immunization is tipped even further. Perhaps the present dilemma for public health clinic use will be resolved with the licensing of the further attenuated measles vaccine which has an acceptable reaction rate when administered as a single injection, although preparations should be made now for the inclusion of the present products in both private practice and public clinic routines.

Special Problems of Young Infants

Febrile responses. Since young infants are more likely to have convulsive episodes associated with sharp increases in body temperature, and since the immunizing agent administered at age two or three months may represent the initial febrile experience for this infant, it is not surprising that convulsions are seen occasionally following the administration of various antigens. Consequently it is desirable to warn the parents about the possibility of febrile reactions, and to suggest that if fever should appear, aspirin be administered in a dose of one grain per year of age up to a maximum of five grains. This may be repeated at intervals of four hours for three doses if necessary. If the infant looks unusually ill, or if fever persists beyond 12 hours, the febrile response is probably due to something other than the antigen.

"*Blanketing effect.*" The effect of passive transfer of maternal antibody has been of some concern, since the blanketing or suppressive effect of passively acquired antibody on antigenic response is well known to most physicians. While it is true that a blanketing effect may be observed following the primary course of antigen administered,[9] it is also true that this does not suppress the response to a booster dose given subsequently.[4] Therefore, it would seem that for the antigens customarily used, the blanketing effect has little practical significance and may be disregarded in staging the immunization series with the notable exception of attenuated measles vaccine.

Immunological immaturity. The newborn infant until the age of two or three months is likely, on the basis of recent data,[12] to respond to at least some antigens with a macroglobulin of the 19s category. The subsequent response, above the age of two months would appear to be that more characteristic of older persons. Until the true nature of this response has been determined, and the immunological pattern determined in later years to booster doses, it would seem preferable to withhold immunizations, except in the face of an epidemic, until age two months or older for the initiation of the series.

Problems in Vaccine Utilization

It is apparent that the effectiveness of mass programs with various antigens has been extremely variable. Under the pressure of an epidemic the response has been gratifying. However, in spite of carefully planned programs with massive use of various communications media, the response in non-epidemic times has often been poor. In Los Angeles in 1962 only 44 per cent of the population appeared for type I oral poliomyelitis vaccine.[13] Although clinics were convenient, it was clear that the vaccine was free to those who could not spare the minimal charge assessed, and the program was begun before concern over the safety of this agent was publicly expressed, the public response was not optimal in this program.

It is apparent that the success of any vaccine program in any community is dependent on careful planning, knowledge of geographic areas of poor vaccine utilization, readily available clinics for the medically indigent, proper motivation, and close liaison between the physicians of the community and the public health personnel involved in clinic operation. Nothing is to be gained for the community by immunizing, or re-immunizing, only those persons in the community who would normally receive this attention as a part of normal health supervision, and indeed the latter is to be much preferred.

Since patients, or their parents, may misinterpret an immunization clinic as an adequate substitute for proper health supervision by their physicians, the development of programs to increase the level of

immunization in the community requires careful coordination. Since many patients have been traditionally more willing to compensate the physician for time spent in performing tangible services (such as immunization or surgical operations) than for less well defined procedures (like routine examination and health supervision when well), this may accentuate the present deficiency in the proper utilization of, and compensation for, physicians' services in the preventive aspects of medical care. It should be noted that at present, immunization procedures yield a disproportionately large percentage of pediatricians' income in respect to time required.

It is hoped that the development of suggested relative value scales for various services by physicians and acceptance of these by physicians and patients alike will aid in removing the present misconception that immunization is the all-important feature of good preventive medical care provided by the physician. Certainly it will do much to reduce the wasteful re-immunization and lack of health supervision of persons attending the "Dollar Clinics" which are at present a popular fund-raising device of service clubs in this country.

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REFERENCES

1. A Collaborative Study of Measles Vaccines in Five United States Communities, presented by Vincent F. Guinee at the American Public Health Association meeting, Kansas City, Mo., Nov. 13, 1963.

2. Benenson, A. S.: Immediate (so-called immune) reaction to smallpox vaccination, J.A.M.A., 143:1238-1240, 1950.

3. Canadian Epidemiological Bulletin, Vol. 7, Nov., 1963 (parts 1 and 2, Epidemiology Division, Dept. of National Health and Welfare, Ottawa, Canada, as cited in Poliomyelitis Surveillance Report 283, Communicable Disease Center, P.H.S., Atlanta, Georgia.

4. di Sant Agnese, P. A.: Combined immunization against diphtheria, tetanus and pertussis in newborn infants, Part II, Pediatrics, 3:181-194, 1949.

5. Edsall, G.: Specific prophylaxis of tetanus, J.A.M.A., 171:417-428, 1959.

6. Greenberg, M.: Complications of vaccination against smallpox, Am. J. Dis. Child., 76:492-502, 1948.

7. Guinee, V. F.: Personal communication.

8. McCarroll, J. R., Abrahams, I., and Skudder, P. A.: Antibody response to tetanus toxoid 15 years after initial immunization. Am. J. Pub. Health, 52:1669-1675, 1962.

9. Park, W. H., and Schroder, M. C.: Diphtheria toxin-antitoxin and toxoid, a comparison, Am. J. Pub. Health, 22:7-16, 1932.

10. Renteln, H. A., California State Department of Health: Personal communication.

11. Report of the Committee on the Control of Infectious Diseases, American Academy of Pediatrics, Evanston, Illinois, 1964.

12. Smith, R. T., Eitzman, D. V., Catlin, M. E., Wirtz, E. O., and Miller, B. E.: The development of the immune response, Pediatrics, 33:163-183, 1964.

13. Wehrle, P. F., Leedom, J. M., Portnoy, B., Pierce, N. F., and Cowper, H. H.: Safety of Sabin oral poliovaccine strains, J.A.M.A., 186:821-826, 1963.



Visible Masses of the Cranial Vault and Its Coverings

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■ *A clinico-pathologic recapitulation of experiences with a variety of masses which are visible and palpable and involve the cranium has led to the realization that examples of almost every major category of disease may be encountered. A review of the many varieties broadens our perspective of the diagnostic possibilities when confronted with a new case.*

The apparently innocent nature of scalp masses may be misleading, and this review can assist in alerting us to the need for stepwise investigation in tracking down the extent of involvement, especially intracranially. The use of limited office surgical procedures should be reserved for the simplest sebaceous cysts and other, readily identifiable, masses entirely limited to the scalp. The midline mass, in particular, deserves respect for its possible continuity with meninges or neural tissue. It should be remembered that the cranial mass may also be a manifestation of more widespread disease processes.

MASSES THAT ARE VISIBLE and palpable above the horizontal interaural plane of the head are of surgical importance, and because a region of the body rather than an organ system is involved, the diagnostic possibilities are numerous. Consideration must be given to the unique anatomical relationship that exists beween masses on the surface of the cranial vault and the underlying cranial contents.

This presentation will be concerned only with the visible, palpable masses that involve the integument protecting the brain and which often constitute in themselves the presenting complaint.

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A systematic discussion of such lesions could begin with a consideration of the tumors that arise from each of the layers of integument: Scalp, periosteum, bone and dura mater. It is frequently not possible, however, to ascertain the extent to which masses are isolated to a given layer, and all too often more than one layer is involved or appears to be involved as the clinical study progresses. However, it is usually possible to determine whether a tumor lies superficial to the periosteum of the skull and is limited to the scalp or, conversely, whether the scalp is spared and can be moved easily over the underlying mass. Involvement of skull, periosteum and scalp together may also be obvious, on occasion.

The biological behavior of the tumor will, in part, govern the extent of involvement, and certain kinds

of masses will be found only in particular layers. For example, a sebaceous cyst will involve only the scalp, whereas fibrous dysplasia will be limited to the skull and periosteum. This is usually true irrespective of the duration of the disease. With neoplastic disease, however, the circumstance will be different. A tumor that is limited in its early stages to scalp or to dura mater may advance to involve all layers. Because of this and because some masses from their early stages involve all layers, it is necessary to be aware that a cranial vault tumor may be more extensive than it first seems. This basic concept should discourage the not uncommon practice of limited biopsy and office procedures for cranial masses which on cursory examination may seem innocent and localized to a superficial layer.

TABLE 1.—*Classification of Visible Cranial Masses**

Congenital and Developmental Defects
- Cranial meningocele
- Meningoencephalocele
- Nasion encephalocele
- Dermal inclusion defect
- Dermal sinus of scalp
- Dermoid cyst of scalp
- Dermal sinus, subgaleal abscess and intracranial dermoid cyst in continuity
- Arteriovenous malformation of cranial integument
- Sinus pericranii

Retention Cysts
- Sebaceous cyst of scalp

Lesions Due to Trauma
- Cephalohematoma (early stage)
- Cephalohematoma (ossified)
- Subperiosteal and intradiploic cysts
- Traumatic meningocele

Lesions of Infectious Origin
- Subgaleal abscess associated with osteomyelitis

Neoplasms
- Dermoid cyst of scalp (see above)
- Lipoma of scalp
- Hemangioendothelioma of scalp
- Intradiploic epidermoid cyst
- Osteoma of accessory nasal sinus and skull
- Osteoma of skull
- Hemangioma of skull
- Meningioma
- Primary sarcoma of skull
- Epidermoid carcinoma of scalp and skull
- Leiomyosarcoma of scalp and skull
- Sarcoma of temporalis muscle skull and brain with cauda equina seeding
- Metastatic carcinoma
- Metastatic sarcoma

Miscellaneous Lesions
- Fibrous dysplasia of skull
- Histocytosis including eosinophilic granuloma

Disease processes which are reported to produce visible tumefactions over the cranial vault but which the author has not encountered are:
- Ossifying fibroma of skull
- Lipoma of skull
- Giant cell tumor of skull
- Osteogenic sarcoma of skull
- Chloroma of skull
- Angiosarcoma of skull (malignant hemangioendothelioma)
- Myeloma of skull

*For a classification of primary tumors of the calvarium some of which will not present as visible-palpable masses see Jelsma.[6]

Material

A total of 37 cases encountered by the author constitutes the background of this paper, and in some form examples of most of the groups of tumors listed in Table 1 are included. Exceptions to this are the intradiploic epidermoid cyst which presents as a visible or palpable mass,[10] and sinus pericranii.[2] Certain case histories of this series have been reported elsewhere and will not be repeated.[11]

There were 11 patients within the first year of life. Two of them had obvious unilateral cephalohematomas over the parietal bone. Two had eccentrically placed vertex, scalp hemangioendotheliomas. The other seven all had midline developmental defects of closure involving the primitive ectodermal and mesodermal tissues. There were five other children between the ages of one and three years, four of whom had congenital lesions resulting from a defect in the infolding of the neural tube and its closure and covering by integument. The fifth child had fibrous dysplasia of the temporal bone.

A midline mass in the first years of life probably represents a congenital inclusion mass with its recognized potential of communication with the meninges or the substance of the brain. Whereas a midline defect in later life may also represent the same category of lesion, it becomes less likely as other disease processes increase in incidence. The other midline masses which were encountered beyond the first three years of life were slightly eccentric in location and included examples of subgaleal abscess, lipoma, meningioma, skull hemangioma and sarcoma. The patients who had these tumors ranged in age from six to sixty-one years.

The remainder of the lesions were laterally located so were not to be confused with midline inclusion defects.

Congenital and Developmental Defects

Case 1. A 12½-week-old male infant was admitted to the hospital with a mass over the anterior fontanelle. Present at birth, the lesion had increased in size and consisted of a fluctuant mass, 4 cm in diameter, overlying the anterior three-fifths of the fontanelle precisely in the midline. The mass transmitted fontanelle pulsations and appeared to reflect intracranial pressure. No overlying scalp abnormalities were present nor were there any other stigmata of congenital defect. At the time of excision the scalp was uninvolved and the cystic lesion lay upon the fontanelle membrane and periosteum without penetration of either. The cyst contained clear, colorless

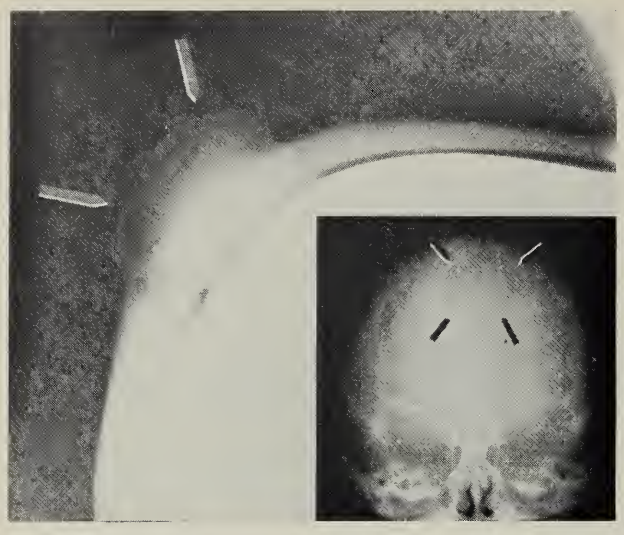


Figure 1.—(Case 1) Roentgenographic visualization of the encephalomeningocele at the site of the posterior fontanelle. Insert demonstrates the underlying midline cranial defect marked by arrows.

fluid with protein content of 14 mg per 100 ml and keratinaceous debris. Pathologic examination showed the cyst to have a squamous epithelium overlying fibrous tissue embedded with hair follicles, sebaceous glands, and sweat glands and ducts. The final diagnosis was dermoid cyst of the scalp.

This was the third such case encountered on this neurosurgical service. In the first two the preoperative diagnosis had been meningocele or encephalomeningocele. No midline scalp dimple, stalk, or other dysraphic anomaly was observed, yet the clinical similarities with a simple cranial meningocele were obvious.

Interesting for purposes of comparison was the case of a ten-month-old infant who had from the time of birth a pulsating fluctuant, transilluminating mass at the site of the posterior fontanelle (Figure 1), the scalp over which was marked with a capillary "port wine" nevus. The underlying cranial defect is seen in the insert in Figure 1. At the time of excision the lesion proved to be an encephalomeningocele.

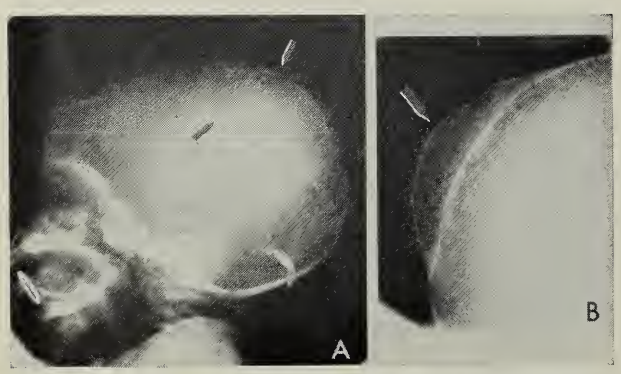


Figure 2.—(Case 3) *A* Lateral roentgenographic demonstration of the ossified cephalohematoma. *B* Tangential radiologic study of the rim of ossification overlying the intact cranial bone.

This was the second such case encountered. In each there was more scalp alteration than in any of the three cases of dermoid cyst, although in two of the latter a halo of scalp capillary hemangioma existed about the base of the mass. Such defects may occur anywhere in the midline including the rare nasal presentations, one of which was encountered in this series. That the posterior fossa is not immune from such lesions is well emphasized by the following experience:

Case 2. A 22-month-old male infant was admitted to the hospital with history that from the time of birth a small, firm, occipital, midline scalp mass existed. Sticky fluid escaped from a dimple in the mass for a few days when the patient was at the age of four weeks. Within the five weeks before admission the mass increased in size and became soft and tender. On examination it was observed to be a 3 x 3 cm fluctuant mass overlying the occipital protuberance. It was tender and was associated with a small, midline scalp dimple (visible only after the scalp was shaved) from which black hairs protruded. No neurologic deficit could be discovered. Radiologic study of the skull showed a smoothly outlined defect 1 cm in diameter in both tables of the skull just below the site of the torcula Herophilii. Operation confirmed the presence of a dermal sinus tract which contained only hair, a contiguous subgaleal abscess (Staphylococcus aureus culture) a ragged cranial defect, a tenuous stalk deep thereto, and a 1.5 cm diameter epidural dermoid cyst from which projected black hair.

Careful evaluation of the possible intracranial extensions of such midline lesions together with appropriate surgical planning and operative exposure, offers the best opportunity for eradication of the mass. An excellent statement of other varieties of dermal sinuses and their intracranial accompaniments is to be found in an article by Logue.[8]

Trauma

The occurrence of a fresh cephalohematoma (subperiosteal hemorrhage) as a result of parturition is a commonplace. Far less common as a cause of cranial masses is the persistence of such a lesion from birth and its calcification and ossification or its occurrence and persistence from a time subsequent to birth. The following are illustrative of such unusual manifestations:

Case 3. A male infant was delivered without forceps after a ten-hour labor with a fluctuant cephalohematoma in the right parietal area. After two weeks the mass became firm and decreased in size to about 6 x 4 cm and remained static thereafter. At seven weeks, the infant was normal except for the hard mass which was immobile beneath the scalp but



Figure 3.—*A* Hard mass in a 38-year-old man. Roentgenographic study shows the preserved integrity of the intracranial contents and the opaque shell of tumor.

with the scalp movable over it. Radiologic study showed a shell of opacification corresponding to the abnormal contour of the lesion (Figure 2). At operation, the mass lay beneath the periosteum, was bony in most areas but was incisable at its dome, and serosanguinous fluid was encountered within a thickly organizing envelope of connective tissue. The latter constituted an inner and outer hematoma membrane, much of which was ossified. The inner floor of bone was thin, and from this the inner membrane could be stripped. The pathologic diagnosis was ossifying hematoma. The late persistence of such an ossified hematoma is suggested by the case of a 38-year-old laborer who came for examination with a bony, hard, nontender tumor (Figure 3A) dating from birth. Full neurologic investigation, including pneumoencephalography and cerebral angiography, disclosed no intracranial disease. The results of blood calcium, phosphorus and phosphatase tests were normal, as was a bone survey. The roentgenographic appearance of the intracranial venous system is shown in Figure 3B. The patient declined surgical excision of the mass; however, the lesion was considered to represent a case of late stage of cephalohematoma stemming from birth. The other differential diagnostic possibility was fibrous dysplasia.

A scholarly review of the probable role of trauma and hemorrhage in the production of cysts of the skull was given by Chorobski and Davis in 1934,[1] and the report by Schüller and Morgan in 1946[9] gave further support to the thesis that adult cranial masses could result from infantile cephalohematomata.

Lesions of Infectious Origin

Case 4. A 6-year-old boy was admitted to the hospital with a nontender fluctuant mass, 5 cm in diameter, eccentrically placed over the low midfrontal area. He was afebrile. Leukocytes numbered 16,700 per cu mm and the sedimentation rate (Wintrobe) was 35 mm in one hour. Roentgenographically the left frontal sinus was opacified and an area of bone destruction was noted. Ten months previously a swelling in this same area had been drained only to recur twice before admission. At operation a subgaleal abscess was encountered (Staphylococcus aureus was cultured), together with several small sequestra involving the outer table of the left frontal sinus. A recurrent mass was evacuated eight months later, at which time fluid pus was encountered in a pocket of thick, infected granulation tissue overlying a small area of frontal osteomyelitis. All grossly diseased tissue was excised and the wound healed kindly after drainage and local antibiotic therapy. Over the three years following this procedure there was no further trouble.

The proximity of a fluctuant mass beneath the galea to sites of possible contiguous bony infection will raise immediately the probability of an infectious origin of the tumefaction. It should be remembered, however, that the scalp mass may be the presenting complaint and give little local signature of its true nature, the latter being discovered only after thoughtful investigation. Systemic indices of infection may also be lacking. Simple, stab-incisional therapy usually will fail. Thorough eradication of the underlying focus often requires wide exposure,



Figure 4.—(Case 5) The fluctuant mass in a 2-month-old infant due to a hemangioendothelioma of the scalp.

removal of all devitalized tissue and adequate drainage, in addition to whatever antibiotic therapy is dictated by wound culture.

Neoplastic Lesions (Benign)

Case 5. A 2-month-old male infant was admitted to the hospital for investigation of a mass over the posterior parietal area and straddling the midline eccentrically. The mass had been present at birth without other complication. It had increased in size and at the time of admission measured 5 x 7 cm across its base, was tense and fluctuant and movable with the scalp (Figure 4). No bone defect could be palpated. Pressure on the open anterior fontanelle did not communicate itself to the mass nor vice versa. Large scalp vessels coursed to the lesion which, across its exposed hemisphere, involved the scalp with an area of erosion which leaked amber-colored fluid. Some areas of hemorrhage beneath the scalp covering could be seen, but other areas transilluminated well. There were semisolid portions of the mass which had evoked no edema or other inflammatory reaction. The lesion was excised and appeared completely circumscribed, lying epicranially beneath the galea but involving the scalp at its dome. The tumor on cut surface was a multicystic fleshy soft tumor which on histologic examination proved to be a hemangioendothelioma.

A second such tumor was encountered in a 5-month-old female infant in whom the growth had been observed first at six weeks of age. It had attained the modest size of 2 x 2.5 cm as it lay slightly eccentrically over the anterior fontanelle. This lesion was more properly designated a capillary hemangioendothelioma but is not to be confused with the common capillary hemangioma.

These two infants had examples of benign hemangioendothelioma of the scalp as described by Stout,[12] and although the tumors showed numerous areas of mitosis in the proliferated endothelial cells, there were no malignant features present. Total excision is required for such lesions.

Case 6. A 64-year-old meat carver was admitted to hospital with complaint of a mass over the back of his head of 17 years' duration dating from a fall. The mass, which had slowly increased in size, consisted of a 7 x 5 cm midline, occipital, soft and semifluctuant tumor beneath the scalp. Its attachments were ill defined. This tumor proved to be a subcutaneous lipoma overlying and below the external occipital protuberance, below the interaural line and the true scalp. The author has not encountered a lipoma of the true scalp.

Case 7. An 18-year-old male student was admitted to the hospital in September 1960 with complaint of a swelling over his left eye of nine months' duration. The swelling steadily increased, left side frontoparietal headaches developed, and for four to

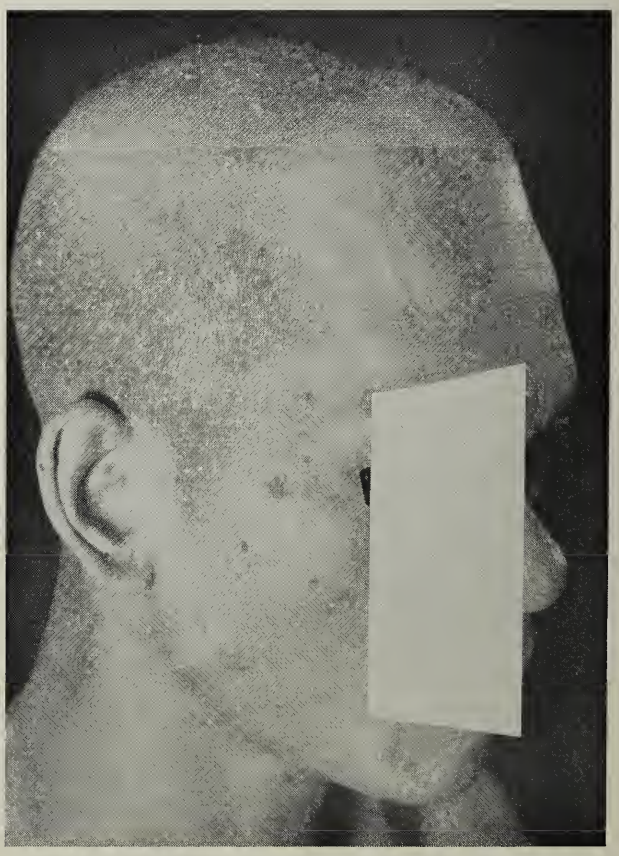


Figure 5.—(Case 8) Bony-hard cranial mass due to meningioma in a 38-year-old man.

five months the patient had noted double vision. Upon examination a bony, hard, left supraorbital swelling could be palpated. The left globe was proptosed and depressed. There were no other abnormal findings except for protein content of 101 mg per 100 ml in the cerebrospinal fluid and roentgenograms which demonstrated a dense, lobulated, opacified mass involving the left frontal sinus. Excision of an osteoma involving the frontal and ethmoid sinuses, the anterior fossa and the left orbit was accomplished. A cranioplastic procedure was carried out six months later.

Osteomas may involve either table of the skull and although usually composed of dense compact bone may vary in character. Usually they grow slowly. The rapid development in the present case and certain of the acute symptoms may be attributed to involvement of the accessory sinuses.

The contrasting way in which tumors of meningeal origin may present with visible tumors is attested to by the following reports of cases.

CASE 8. A 38-year-old man was admitted to the hospital in January 1963 with a two and a half year history of a painless bump behind the hairline. Upon examination he had a 5 x 5 cm bony, hard, nontender mass in the left frontal area without scalp involvement (Figure 5). Skull roentgenograms and differential external-internal carotid angiography led to the diagnosis of a meningioma which received its blood supply mainly from the external carotid artery but without significant shift of intracranial contents and no pial penetration. The mass was excised without incident, and the pathological diagnosis confirmed the clinical impression.

CASE 9. A 72-year-old widow was admitted to the hospital in March 1963 with complaint of a growing lump on her head first noticed about a year previously. Upon examination a 10 x 14 cm mass was observed to occupy the right frontal region (Figure 6). It had the consistency of a tennis ball and was nontender. The scalp covering it, however, was tense and vascularized beyond the normal, with pitting edema at the base of the lesion for a centimeter around the margins. The mass transmitted pulsations from the intracranial chamber but there was no bruit. The tumor was not translucent. The involvement of the bone of the skull extended well beyond the limits of the visible mass. Following cerebral angiography, excision and cranioplasty was carried out. The tumor was a meningioma with features of malignant change.

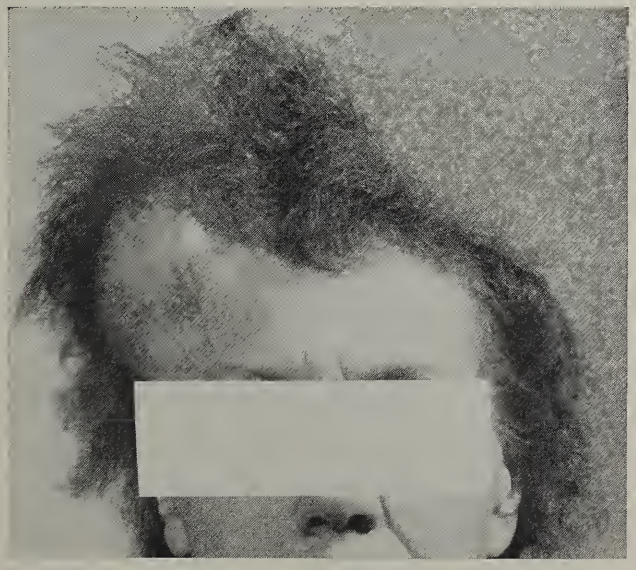


Figure 6.—(Case 9) Soft cranial mass due to meningioma in a 72-year-old woman.

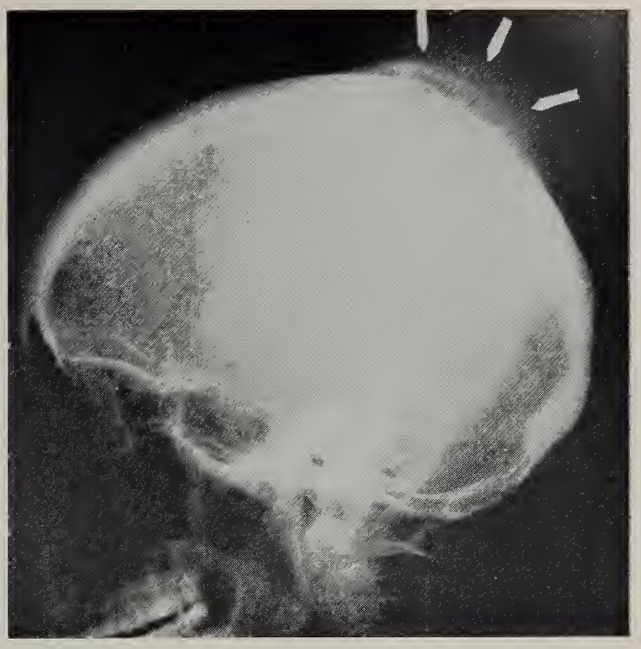


Figure 7.—Plain roentgenogram of a 74-year-old woman with an 8x4 cm cranial mass, focal seizures involving the leg, organic dementia and spastic paraparesis.

These cases illustrate the extremes of the apparent consistency of masses due to meningeal tumorous growth. Furthermore, the hyperostosing reaction of bone in the first case is contrasted with the more destructive behavior, suggestive of malignant disease in the second case; yet in neither was intracranial encroachment sufficient to produce neurologic symptoms or signs beyond the presence of the mass. The combination, however, of signs of underlying brain compression with neurologic deficit and visible tumor is an equally common manifestation (Figure 7). In the differential diagnosis of such lesions, particularly in the absence of cerebral symptoms, it is obvious that benign osteomas, chronic osteomyelitis, sclerosing osteogenic sarcomas, hemangiomas and metastatic disease may require consideration.[3,4]



Figure 8.—Lateral roentgenogram of a 61-year-old man shows bone destruction in the frontal area and overlying visible mass due to epidermoid carcinoma.

Neoplastic Lesions (Malignant)

Case 10. A 38-year-old man was admitted to the hospital with the complaint that for 11 years he had been aware of a tumor on the top of his head which had begun as a 1 cm cyst and recurred twice after local incision procedures carried out in a physician's office. Just before the patient was admitted, the mass grew, ulcerated, exposed the skull and became associated with headache. Examination disclosed a foul smelling, ulcerated tumor crater involving the entire crown of the head with secondary infection. The cerebrospinal fluid pressure was 300 mm of water and carotid angiography revealed extension of the mass into the intracranial chamber. Only palliative excision could be undertaken. The tumor was a leiomyosarcoma and the patient died eight months later. The long history of the malignant tumor in this case suggests that earlier more radical attempts at excision might have been successful.

Recently a 61-year-old man was seen on the neurosurgical service with a 13-week history of a rapidly enlarging and destructive mass in the right frontal area which was being treated as sinusitis and osteomyelitis because of a 40-year history of sinus disease. Extensive bone destruction underlay this nontender, firm lesion (Figure 8). At operation a fleshy solid epidermoid carcinoma occupied the extradural fronto-orbital area.

These examples together with others in the series permit us to say that primary, malignant tumors of the integument, malignant tumorous spread from adjacent contiguous tissue, and disseminated malignant disease may appear in the form of a cranial mass. Metastatic malignant lesions, both carcinoma and sarcoma, may involve scalp or skull and appear as a visible, palpable mass; and to think of it is tantamount to diagnosing it.

Miscellaneous Lesions

We have encountered three cases of cranial involvement with fibrous dysplasia appearing as a visible mass. In two of these cases there was polyostotic involvement of skull and facial bones and in one a monostotic involvement of only the temporal bone. This condition, with its beginnings in infancy or childhood, may show episodic spurts of progressive growth and, although sarcomatous change may occur within the diseased bone, this complication is rare. An excellent discussion of the condition appears in the book by Jaffe.[5]

The remaining condition, of unknown cause, is introduced by the following case:

A 43-year-old man was admitted to hospital with complaint of a slowly growing mass above the right ear for five years without known injury. Upon examination a 3 x 4 cm smooth, oval, bony hard, nontender mass, covered by normal skin, was noted in the right midtemporal area above the external ear. Radiographic studies demonstrated irregular lucency in this region. At the time of excision the periosteum stripped from the mass; the outer table was thin with a yellowish hobnail appearance and a bluish background. The inner table of the skull was gone and the space was filled with yellowish, gritty, granular material beneath which lay a yellow, thickened dura mater. The lesion proved to be histocytosis somewhat resembling Hand-Schüller Christian's disease and (except for the absence of eosinophils) eosinophilic granuloma. When histocytosis X, a proliferative, inflammatory histocytosis involves the skull, it may produce a mild protuberance or swelling, rarely very prominent and more often absent as in the more commonly designated eosinophilic granuloma. When limited to bone the disease may be considered confined and of good prognosis. The relationship of the bone lesion with extraskeletal involvement is clearly set forth by Lichtenstein,[7] and when such multisystem occurrence is found the prognosis becomes far less sanguine.

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REFERENCES

1. Chorobski, J., and Davis, L.: Cyst formations of the skull, Surg. Gynec. & Obst., 58:12-31, 1934.

2. Courville, C. B., and Rocovich, P. M.: A contribution to the study of sinus pericranii (Stromeyer): Report of case with some comments on pathology of the lesion, Bull. Los Angeles Neurol. Soc., 11:145-158, 1946.

3. Cushing, H., and Eisenhardt, L.: Meningiomas; Their Classification, Regional Behaviour, Life History, and Surgical End Results, C. C. Thomas, Springfield, Ill., 1938.

4. Echlin, F.: Cranial osteomas and hyperostoses produced by meningeal fibroblastomas; a clinical pathologic study, Arch. Surg., 28:357-405, 1934.

5. Jaffe, H. L.: Tumors and Tumorous Conditions of the Bones and Joints, Lea & Febiger, Philadelphia, 1958.

6. Jelsma, F.: Primary Tumors of the Calvaria, C. C. Thomas, Springfield, Ill., 1959.

7. Lichtenstein, L.: Histiocytosis X; integration of eosinophilic granuloma of bone, "Letterer-Siwe Disease" and "Schüller-Christian Disease" as related manifestations of a single nosologic entity, A.M.A. Arch. Path., 56:84-102, 1953.

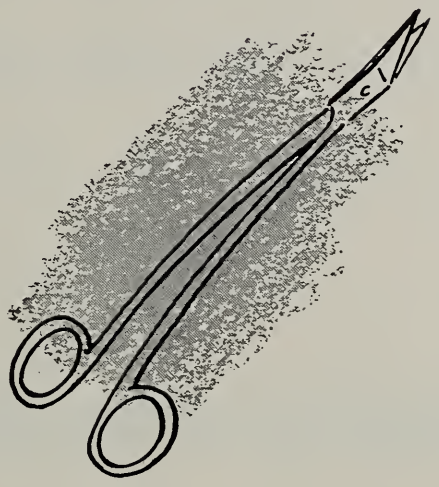
8. Logue, V., and Till, K.: Posterior fossa dermoid cysts with special reference to intracranial infection, J. Neurol. Neurosurg. & Psychiat., 15:1-12, 1952.

9. Schüller, A., and Morgan, F.: Cephalhematoma deformans; late developments of infantile cephalhematoma, Surgery, 19:651-660, 1946.

10. Skandalakis, J. E., Godwin, J. T., and Mabon, R. F.: Epidermoid cyst of the skull; report of four cases and review of the literature, Surgery, 43:990-1001, 1958.

11. Stern, W. E.: Visible tumors of the cranial vault, West. J. Surg. Obst. & Gynec., 68:162-171, 1960.

12. Stout, A. P.: Tumors of the Soft Tissues in Atlas of Tumor Pathology, Sect. 11, Fascicle 5. Armed Forces Institute of Pathology, Washington, D. C., 1953.



Antenatal Supervision

A Review of Obstetrical Care with Suggestions for Reevaluation

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■ *Studies by California Maternal Mortality Study Committees over a period of six years have revealed many avoidable inadequacies in the care of pregnant patients. Other reviews have shown a high incidence of non-fatal complications arising early in pregnancy when care is often inadequate.*

Since antenatal care is justly credited with the vast improvement of the incidence of maternal mortality, maternal morbidity and perinatal salvage, it is time for a reevaluation and upgrading of present-day practices. Responsibility is shared by the medical and auxiliary professions and the community. The public as well as those who care for the expectant mother must have improved educational exposure to achieve better results.

IMPROVEMENT in maternal care has been properly credited with the great reductions in incidence of maternal mortality, maternal morbidity and perinatal damage and loss that have taken place in the last four decades. Recent studies in California indicate that there are many areas where upgraded standards of antenatal supervision could further improve the results being obtained. An effort is being made here to review available data and suggest reevaluation of obstetrical care for the betterment of all concerned.

The record of improvement of obstetric and perinatal mortality in California during the past forty years,[3] on first glance, appears to be remarkable:

	Death per 10,000 Live Births		
Year	*Obstetric*	*Fetal*	*Neonatal*
1920	70	306	362
1940	28	204	254
1960	3	129	172

We must hasten to say that in 1959, the most recent year for which information is available for all states, our state had an obstetric death rate higher than the New England region, the North Central states, Oregon and Washington.

Maternal mortality study committees in California during the past six years have evaluated 551 maternal deaths and assigned responsibility factors whenever they could be determined.[3] These avoidable factors pertain to the patient, the professional attendant and the available hospital facilities. It is apparent that there is much to be done in each responsible area to eliminate these factors.

The obvious lack of basic understanding on the part of the patient regarding the importance and necessity of seeking care early in pregnancy before complications develop, points to deficiencies in our elementary and high school curricula. Health courses have not emphasized the need for premarital, pre-pregnancy and periodic health examinations regardless of age or economic status. The community and the patient must accept this responsibility if the toll taken by early complications of pregnancy, especially criminal abortion, is to be lessened. The avoidable factors attributable to the patient accounted partially or wholly for 227 deaths or 41.1 per cent in the series of the 551 deaths studied (Table 1).

The professional factors which were judged avoidable included errors in judgment and technique or inadequate care. This accounted partially or wholly for 335 deaths or 60.7 per cent, which indicates the need for reevaluating our present standards of care and erasing this blight on our profession.

Table 1 also shows the avoidable factors assigned to inadequate hospital facilities. This was a partial or total factor in 33 deaths or 6 per cent of the cases studied. This should be rapidly controlled.

There were 47 deaths or 8.5 per cent in which the avoidable factors could not be identified by the evidence available. Improved records, better cooperation of professional and hospital personnel, and better understanding by coroners and medical examiners could have provided more lucid data.

In 23.1 per cent no factor whose discovery might have prevented the death could be found. Included in such cases were the well cared for patients who had the benefit of all the facilities thought to have been necessary to prevent the death. Better knowledge, more effective drugs and equipment and newer methods will decrease even these fatalities in the future.

The newer diagnostic facilities now available may be used advantageously in obstetrical practice. Modern tests that will indicate ectopic pregnancy, more accurate diabetic evaluation, improved sensitization tests for blood agglutinin problems, newer techniques in cardiac and renal surveys, amnioncentesis and fluid studies, sonar diagnostic methods, fetal electrocardiography, amnionography and placentography are all most promising.

Our present standards of care before delivery are properly identified as antenatal rather than prenatal, as the latter term pertains to the infant. It is rather unusual for patients to seek pre-pregnancy

TABLE 1.—*Avoidable Factors Noted in Study of 551 Maternal Deaths in California*

Apparent Responsibility (in part or whole)	*Number of Deaths*	*Per Cent**
None	127	23.0
Inadequate antenatal care	120	21.7
Physician	21	3.8
Patient	80	14.5
Both	19	3.4
Patient error or refusal	33	6.0
Abortion (induced)	95	17.2
Judgment error professional	247	44.8
Technical error professional	48	8.7
Inadequate hospital facilities	33	6.0
Indeterminate	47	8.5
Summary:		
Deaths attributable wholly or in part to shortening of:		
Patient	227	41.1
Professional care	335	60.7
Hospital	33	6.0

*More than one factor was present in some cases.

Chairman's Address: Presented before the Section on Obstetrics and Gynecology at the 93rd Annual Session of the California Medical Association, Los Angeles, March 22 to 25, 1964.

TABLE 2.—*Data on Antenatal Care in Cases of Maternal Mortality*

	Number	Per Cent
Care during pregnancy:		
None	160	29.0
Unknown	48	8.7
Formal care	343	62.3
First visits for care:		
First trimester	175	44.8
Second trimester	100	25.6
Third trimester	43	11.0
Unknown	73	18.7
Number of visits:		
1	26	6.6
2 to 5	95	24.3
6 or more	194	49.6
Unknown	76	19.4

evaluation, even when known organic disease such as diabetes and cardio-renal conditions are present. The medical profession, public health agencies and parental counselling all bear part of the responsibility for this neglect.

In a New York study of unmarried mothers a dramatic difference in infant mortality was noted between patients having antenatal care and those who had none.[3] In the same period there were 116.6 deaths per 1000 live babies born to unmarried mothers who had no antenatal care, as compared with a rate of 32.2 per 1000 live births for unmarried mothers who had some care.

A survey made at Los Angeles County Hospitals in 1958[6] regarding the adequacy of antenatal care in patients delivered there revealed typical facts. Care was classified as adequate if the first visit was made in the fourth month of pregnancy or earlier, and if at least five visits were made. Seven of each ten patients received inadequate care and two out of ten received no antenatal care. Transiency, language and cultural factors, poor education, living out of wedlock, youth of patients, external obstacles and patient attitudes were found to contribute to the inadequacy of the care.

The study committees assumed that antenatal care was significant if the patient presented herself to a medical attendant at any reasonable time before her

TABLE 4.—*Incidence of Complications by Trimester (Peckham and King[5])*

	Complication of Pregano Birth Per Cent	Not Related to Pregnancy Per Cent
Trimester:		
First	10.6	33.4
Second	24.9	37.7
Third	64.5	28.9

fatal disability. It has been repeatedly noted that there is considerable variation in the quality, quantity and methods of medical supervision of pregnant women. The standards of practice in timing of the first visit and what it includes; the frequency of visits and degree of attention to patients by the physician; the extent of laboratory procedures; and the usage of pertinent consultants are so variable that comparisons are almost impossible even with qualified obstetricians. Table 2 records antenatal care experience by these patients.

Patients reported difficulty in arranging primary visits before the third month unless there were complications already present. Some physicians and their office staffs see no reason to examine these willing and informed patients early even though 24.5 per cent of the maternal mortalities occur in early pregnancy (Table 3). Of course 29 per cent did not seek care at all. It has also been noted by Peckham and King[5] in a large group clinic where 62 per cent of patients appeared for care during the first three months, that 10.6 per cent of this group had complications of pregnancy and 33.4 per cent had intercurrent medical conditions requiring care (Table 4).

Many current textbooks, U. S. Department of Labor manuals and certain published instruction monographs suggest that during the early months of pregnancy monthly visits to a physician are adequate for care. Occasionally three-week intervals are recommended. Typically, the pattern starts with the first visit after the second missed menses, then monthly visits until the seventh calendar month, two-week intervals until the final month, and then weekly examinations until delivery.

TABLE 3.—*Maternal Deaths by Cause of Death and by Weeks of Gestation*

	Total		Abortion		Other Obstetric		Non-Obstetric	
Weeks of Gestation	*Number*	*Per Cent*	*Number*	*Per Cent*	*Number*	*Per Cent*	*Number*	*Per Cent*
Under 20 weeks	135	24.5	78	71.6	25	10.1	32	16.4
20 to 27 weeks	44	8.0	11	10.1	8	3.2	25	12.8
28 to 36 weeks	97	17.6	3	2.8	40	16.2	54	27.7
37 weeks and over	212	38.5	—	—	151	61.1	61	31.3
Not stated	63	11.4	17	15.6	23	9.3	23	11.8
Total	551	100.0	109	100.0	247	100.0	195	100.0

The quality of present-day care leaves much to be desired. In many private physicians' offices, even qualified obstetricians, (and much more frequently in public clinics and county hospitals) nurses and medical assistants are required to take obstetrical histories and do much of the follow-up evaluations. Check-list histories have little value unless tabulated by a qualified and astute physician. Cursory primary and follow-up examination of the patient is often the rule when the examiner is disinterested, careless or unqualified. Furthermore, it has been noted often that complicating systemic disease may have been recognized but proper care was not provided to stabilize or effectively control it.

Injudicious use of drugs, hormones and x-ray during the course of pregnancy has been noted frequently. The welfare of the fetus appears to be ignored or casually considered in these instances. Even accidental exposures to some of these hazards occur often enough to be significant. It is time that we reevaluate our present inconsistent, variable and poorly defined care of the pregnant woman.

Preventative medicine in obstetrics is relatively new. At the turn of the century, textbooks noted that care should be given throughout the pregnancy on a regular schedule. Ballantyne[2] was one of the first physicians to recommend antenatal care as such. In the United States the first attempts at programming such care were made in 1912 at Boston by de Normandie.[2] The concept has been widely accepted by physicians and patients and the results have been wonderfully rewarding but we have much room for constant improvement.

The object of maternal welfare is to return a woman after childbirth to a state of health at least equal to that which she enjoyed before pregnancy and leave her with a normal healthy child.

The greatest value resulting from antenatal care is the true health evaluation of the patient, preferably before pregnancy or as soon after conception as is practical. This must include a complete medical history taken by the physician and recorded in detail. The first examination must be thorough from head to toe. Essential laboratory tests include routine chemical and microscopic urinalysis, complete blood cell count and hematocrit determination, serologic tests for syphilis and determination of blood group and Rh factor. It is now apparent that isoglutinin titres should be obtained on all pregnant women as a routine because of the many reactive agglutinins being found to be a source of trouble for mother and baby. Papanicolaou smears are as essential as in the non-pregnant regardless of the age of the patient. Roentgen studies are to be done only when specifically indicated and timed according to the least dangerous and most advantageous date to acquire necessary information. X-ray pelvimetry, for example, is most helpful at term or during labor.

Disease entities including dental foci must be controlled or eradicated if possible. Tuberculosis is to be searched for in a standardized manner. Intern and resident staffs often overlook care of these conditions although they are alert enough to detect them. Pertinent consultation must be arranged and the course planned and managed by joint action of the physicians concerned, but the obstetrician should be the managing director of the care because the final decisions are his responsibility.

Instruction of the patient regarding the normal physiological processes of gestation and parturition should be begun at the first visit and continued through the last postpartum examination. Adequate printed material, visual aids and group counselling often effectively supplement this important phase of the care. Personal attention to these details by the obstetrical attendant in his frequent interviews becomes the backbone of good rapport which builds the confidence that is imperative.

Follow-up attention of the gestate must obviously be improved if we are to reduce avoidable maternal and perinatal deaths. The high toll in the first trimester, although highly contamined by septic abortions, can be improved with intensive medical supervision. To accept our responsibility regarding the patient's life and health (as well as that of the developing fetus) it is necessary to evaluate the cardinal signs and symptoms on the examining table at two-week intervals from the earliest opportunity after conception until the last four to six weeks, when weekly visits are obviously essential. The average number of visits per patient, in our experience, has been 18. The patient may be weighed and urinalysis done by a medical assistant or nursing personnel, but history-taking, determining blood pressure and examining the abdomen, breasts, extremities and any other pertinent anatomical areas are the physician's duty. Liberal but judicious use of pelvic examination in late pregnancy or at other times is well worth while in detecting malposition, disproportion and other abnormalities, and occasionally one may find unsuspected pelvic disease, breast cancer or malignant melanoma. Repeated blood tests, especially hematocrit determination, are indicated in many cases.

Cautious conservation must govern the use of drugs, hormones, antibacterial agents, chemotherapeutic agents, biological materials and vaccines.

TABLE 5.—*Causes of Maternal Deaths Assigned by Committees*

Cause of Death	*Number*	*Per Cent*	*Number Related to Pregnancy*
All deaths studied	551	100.	450
Total obstetric deaths	357	64.8	357
Abortion	109	19.8	109
Without sepsis	35	6.4	35
With sepsis	74	13.4	74
Sepsis (excluding abortion)	52	9.4	52
Hemorrhage	39	7.1	39
Toxemia	35	6.4	35
Ectopic pregnancy	28	5.1	28
Other obstetric cause	94	17.0	94
Total non-obstetric deaths	194	35.2	93

The current literature contains impressive reports of teratogenic, recessive genetic and direct effect on the fetus or the mother or both. If a therapeutic agent does not offer extreme advantage or is not specifically indicated, it should be withheld.

The major causes of maternal morbidity and mortality still are hemorrhage, toxemia and infection. Attention to diagnosis and treatment of anemia, bleeding tendencies and threatened abortion, and avoidance of traumatic deliveries, save many unnecessary and dangerous transfusions. Proper nutritional counselling and rigid weight control is probably our outstanding effort toward the prevention of eclamptogenic toxemia. Infection still causes many deaths in spite of our advanced knowledge of antibacterial drugs. Septic abortion and puerperal infection with drug-resistant organisms and their toxins take a large toll (Table 5).

Abortion

Illegal abortion is a responsibility not only of the patient but of the community. The dangers of tampering with the condition of pregnancy in any but aseptic circumstances are not widely enough advertised. Therapeutic abortion under proper conditions is a rare cause of death.

Present legislative efforts to liberalize indications for induced abortion in California probably would have little effect on the incidence of criminal abortion because medical and socio-economic indications would be the basis of control. Most criminal abortions are the result of impulsive action by a desperate woman who has no idea of the risk.

Education is needed to conquer this scourge and the problems related to delayed antenatal care. Our teenage population must be taught the facts regarding pregnancy, its seriousness and the importance of early adequate care. The community should be kept informed as to the dangers and sequela of criminal abortion. Counseling by a good physician at the right moment might save many a life and offer desperate women other means of solving their problem.

The effort being made by the American College of Obstetricians and Gynecologists in cooperation with writers in popular magazines to publicize the importance of antenatal care and the complications of pregnancy is commendable. (See *Redbook* magazine, February, 1964). This organization has also recently introduced, through a speakers' bureau, a program of education regarding pregnancy and other conditions which is directed to medical and paramedical personnel as well as the general public.[1]

The obvious practical question proposed by those interested in improved maternal care is the cost. This of course varies with many things. Geographical differences are noted in all categories of medical expenses, hospitalization, drugs, laboratory fees and physicians' services. This variation relates to costs of providing these services, cost of living, ancillary personnel, rental, maintenance, taxes and insurance (including malpractice).

A representative survey of active obstetricians in metropolitan areas throughout California reveals that the obstetrical dollar is divided as follows:

	Per Cent
Obstetricians' services	39.0
Anesthesiologists' services	5.0
Hospitalization	48.0
Out-patient laboratory fees	4.0
Drugs	4.0
	100.0

A vague estimate indicates that about 42 per cent of the obstetrician's fee covers antenatal care. Patients get the idea that the delivery is the main thing and that the care before and after this event is sort of thrown in. We should more accurately define the phases of our service and clearly describe the importance of each phase. About 32 per cent of the obstetrical dollar goes for adequate antenatal care.

Usually the physician's fees are determined on a contract basis and vary with the amount of service given. The amount per visit is usually small. Obstetricians and generalists who provide equal services charge approximately the same amount. The general physician usually leaves a leeway for probable consultant's fees. Generalists who give casual care usually charge accordingly.

Health care prepayment and insurance plans have not provided dual schedules of fees, thus making it difficult for the specially trained attendant to obtain a fair and adequate return for his usual care. What is needed is allowances adequate for uniform

superior care during pregnancy by physicians who are trained and experienced in obstetrics, regardless of diplomas or titles. Minor obstetrics frequently becomes major obstetrics without warning and the maternal mortality studies previously discussed indicated many avoidable factors attributable to failure of an unsuspecting practitioner to realize the seriousness of a problem. Routine care of uncomplicated cases can certainly be provided by personal physicians but they must have had extra training and experience and an alert interest in this field of medicine. Obstetrical consultants would gladly cooperate with such attendants. It is the delay in obtaining specialized help by those who let pride or lack of knowledge dominate their thinking, that leads to catastrophe and subsequent salvage undertakings which are assumed by the consultant in the face of extraordinary risks.

Hospital costs have been found to approximately equal the obstetrician's usual cost if standard approved hospitals are considered. Contrary to general belief, charity hospital care is the most expensive that is available and would be extreme if all patients who are eligible took advantage of the complete care which is available. The reason the mortality and incidence of complications are highest in patients dealt with in charity hospitals is that such patients do not seek supervision early enough for proper preventive care or even salvage.

Laboratory costs during the pre-hospitalization course vary somewhat in different areas for obvious reasons. Most routine procedures are done in physicians' offices at small additional cost. Other important tests are not to be neglected and must be done by properly trained personnel regardless of expense.

It is perhaps a wasteful traditional routine to prescribe supplements of vitamins and minerals which are of questionable need unless specific indications exist, but since this risk is negligible and often the assurance of the patient is notable, they are permissible.

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REFERENCES

1. American College of Obstetricians and Gynecologists, Newsletter, Chicago, Nov. 1963.

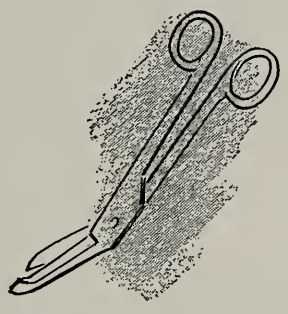
2. Cianfrani, T.: Short History of Obstetrics and Gynecology, Springfield, Ill., Thomas, 1960.

3. Montgomery, T. A., Lewes, A., and Hammersly, M.: Maternal deaths in California, 1957-1962, Calif. Med., 100:412-421, June 1964.

4. Pakter, J., Rosner, H. J. Jacobziner, H., Greenstein, F.: Out-of-wedlock births in New York City: II. Medical Aspects, Am. J. Pub. Health and the Nations Health, 51:846-865, June 1961.

5. Peckham, C. H., King, R. W.: Study of intercurrent conditions observed during pregnancy, Am. J. Obstet. and Gynec., 87:609-624, Nov. 1963.

6. Swayne, J. B., Ross, I. F., Edgerly, R. H.: Prenatal care of patients delivered at Los Angeles County hospitals, California's Health, 18:1-3, July 1960.



Injuries of the Upper Extremity

The Role of the Reconstructive Surgeon

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■ *Proper primary care of the injured hand minimizes both temporary and permanent disability. It is essential that the physician undertaking the primary management and treatment of an injured hand appreciate the problem and understand the available procedures and techniques. Thoughtful examination of the injured part, noting loss of voluntary motion or any absence of sensation, and adequate x-ray studies will assist in outlining the appropriate immediate care.*

By carefully and thoroughly debriding the wound, restoring bony anatomical alignment and obtaining satisfactory skin cover, the stage is set for maximum salvage of the injured hand. By evaluating the time interval (minutes to 12 hours since injury), as well as the type of injury (laceration, crush, or avulsion trauma) and the structures involved (fractures, cut nerves and tendons, skin loss), one can properly undertake the primary repair of the damaged tissues. The choice between primary or delayed tendon and nerve repair should be carefully weighed, dressing applied judiciously and correct splinting carried out so as to minimize ultimate deformity and disability. Rehabilitative measures including voluntary exercise by the patient should be begun early.

PROMPT AND JUDICIOUS primary management of the injured hand simplifies the problems of the reconstructive surgeon.

The role of the specialist in surgical treatment of the hand is:

1. To be available for primary care of the more severely injured hands.

2. To fit into the picture later with various reconstructive procedures, if and when indicated.

3. To point out the principles and specific details to all the persons (surgeons, nurses and therapists) who may have a part in the management and care of the many patients with temporarily disabled hands.

Adequate primary care of the injured hand minimizes both temporary and permanent disability.

It is essential that the physician undertaking the primary management and treatment of an injured hand appreciate the problems, understand the available procedures and techniques and be willing to undertake the sometimes tedious and arduous task of rehabilitation of the crippled hand. He must first

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obtain a crisp picture of the factors influencing the individual case, by evaluating the time interval since injury, the type of injury (laceration, crush or avulsion), type of trauma and the structures involved (fractures, cut nerves and tendons and loss of skin). The choice between primary or delayed repair of tendons and nerves should be carefully weighed in each case.

Thoughtful examination of the injured part, noting any loss of voluntary motion or absence of sensation, aided by adequate x-ray studies and a carefully taken history, will assist in outlining the appropriate and immediate primary care. The surgeon sets the stage for minimum tissue reaction, prompt healing without infection and maximum salvage of the injured hand by:

1. Carefully applying an adequate dressing in the emergency room to protect the wound from further contamination.

2. Thoroughly cleansing the wound with copious irrigation and mechanical scrubbing in the operating room.

3. Meticulously and thoroughly debriding the wound under pneumatic tourniquet and anesthetic of choice (peripheral nerve or axillary block).

4. Restoring anatomical alignment and obtaining skin closure.

Upon completion of primary surgical repair, dressings must be applied judiciously and splinting carried out correctly to minimize ultimate deformity and disability. Thus, the period of temporary disability may be minimized and the stage set for various reconstructive procedures to obtain maximum recovery of function of the hands and digits.

One of the most important aspects of primary care is decision between carrying out full treatment of all the involved structures initially, or simply accomplishing closure of the wound and carrying out delayed repair of the deeper tissues later. It is apparent that this decision depends upon the type of wound—tidy or untidy—the amount of contamination of the wound, the time interval since injury, the availability of facilities for detailed treatment and the age and general condition of the patient.

By carrying out primary repair shortly after injury, one minimizes temporary disability and restores function generally with one procedure. This is of considerable importance financially to the patient and the insurance carrier, and psychologically to the patient (by returning him promptly to a useful spot in society). Although initial complete primary repair is considered most desirable, it should be remembered that in many selected cases simple closure of the wound and delayed primary repair of the deeper structures meets the standards of medical practice. The type of wound, the possibility of infection, the condition of the patient and the time interval since trauma may obviously contraindicate the undertaking of extensive deep tissue repair on the day of injury. Delayed repair entails a longer period of temporary disability and necessitates a second procedure, superimposing the problems of added scar formation and prolonged joint stiffness. Thus, the benefits and drawbacks in the circumstances of each case should be carefully weighed by the surgeon who sees the patient first. Using the pneumatic tourniquet while examining the injured area is of great importance. This provides a bloodless field, permitting the best visualization of the tissues and affording minimal trauma to the exposed structures.

Wound Closure

Wound closure, an important essential of primary care, provides appropriate cover to the injured part and minimizes scar and contracture formation. The method can be selected from the most applicable of the following:

1. Primary closure by suture without tension.
2. Closure by suture and split thickness skin graft.
3. Use of a thin split thickness skin graft.
4. Use of full thickness free Wolfe graft.
5. Closure by local flap: (a) Advanced or rotational; or (b) cross finger flap and split thickness graft.
6. Direct full thickness flap from a distant area—Cross arm, chest flap or abdominal flap.

Ideally, one would prefer primary closure by suture without tension, and in the case of tidy lacerated wounds this is usually possible. It is far better to carry out partial closure by suture, utilizing a small split skin graft over a portion of the wound, than to achieve full closure if doing so entails tension. Tension only leads to swelling, necrosis, delayed healing and increased scar tissue. If there has been considerable swelling from edema and infiltration of blood into the tissues (as there may be if a good deal of time has elapsed since injury) use of a split thickness skin graft over the entire wound may be indicated. However if the nature of the wound is such that deeper structures such as tendon, nerve, joint or bone are uncovered, the use of a full thickness free Wolfe graft or closure of the wound by a local full thickness skin flap may be required.

On tips of fingers, when only skin is avulsed, the fatty subcutaneous tissue will take a thick split skin graft satisfactorily. If a portion of the terminal phalanx is exposed by the avulsion, a full thickness free Wolfe graft is adequate. Material for the graft can be taken from the elbow skin crease of the same extremity under the same tourniquet. When the

edges of the graft are carefully approximated and held in place with a beeswax grease gauze stent, healing occurs without hematoma or infection, and satisfactory, serviceable skin cover is provided.

Where repair of a tendon, digital nerve or a compound fracture is necessary in a digit or in the hand, a local skin flap from the side of the finger or side of the hand may be required to cover the repaired deeper structures. The flaps may be advanced or rotated, depending on the area to be covered and the skin available for an adequate flap. Special care must be taken not to have the flap too long or the base too narrow, and not to twist the vascular pedicle or apply tension or pressure with sutures or dressings.

A cross-finger flap may provide satisfactory full thickness skin cover if the site is properly placed and the procedure carefully carried out. On occasion a full thickness flap of skin from a distant area may be necessary. Coverage of the entire volar aspect of the finger may be obtained by means of a cross-arm flap. The volar aspect of the thumb may be covered by a chest strap flap. For covering the entire dorsum or the palm of the hand or the thumb cleft an abdominal flap can be used. Here the various principles of plastic surgical repair must be rigidly adhered to and careful judgment must be exercised to avoid the many possible pitfalls.

Dealing with the Bony Framework

The importance of the underlying bony framework of the hand and digits cannot be overemphasized, especially in cases of extensive trauma associated with crushing wounds, in which fractures are frequently encountered. The normal bony framework of the hand and the position of function of the thumb and fingers must be restored to promote healing, prevent deformity and maintain normal tendon leverage and muscle balance of the hand and forearm. Care should be taken to support the wrist, the key joint in maintaining muscle balance of forearm and digital musculature. This position of function must be kept in mind by all who are concerned with the disabled hand during all stages of treatment, convalescence and rehabilitation. Restoration of alignment of the bony structures and the maintenance of joint mobility are of utmost importance to the goal of maximum function.

Early and adequate reduction of a fracture restores anatomical bony alignment. After reduction, proper immobilization can be achieved by use of various types of plaster casts, including the Böhler splint and sugar tong plaster splint. Light form-fitting volar plaster splints are far more efficient than flat boards, metal universal splints, tongue blades or the various and sundry heavy encumbering apparatuses. Traction gadgets are only to be condemned. A number of plastic vinyl splints for the individual finger or thumb have been found very satisfactory and are being used increasingly. Also being more widely used are Kirschner wires, especially in treating compound fractures, selected fractures of the thumb and fractures about finger joints.

While it is important to prevent motion or displacement of fractured bones during healing, it should be remembered that the hand is prone to edema and stiffness and that unnecessary immobilization of any of the digits or encumbering uninjured parts is to be avoided. Voluntary exercise of the uninjured parts of the extremity prevents digital stiffness. Elevation of the hand and forearm on pillows or in a sling is useful in the prevention of swelling. Circular plaster casings and unduly snug dressings are to be avoided. Voluntary active exercises should not be started until healing is well underway; early passive manipulation and stretching generally only impede healing. Early mobilization of the digits assists in restoring motion and in minimizing edema, swelling and stiffness. Active exercises, voluntary use, and dynamic splints all have an important place in the postfracture treatment.

Sprains and Dislocations

With the increased tempo of industry and society, contusions and crush injuries resulting in sprains or dislocations of the joints of the digits of the hand frequently occur. These injuries often do not receive the attention they deserve. Trauma to the soft tissues about a digital joint results in swelling, persistent edema, subjective symptoms and prolonged stiffness of the involved digit. Inadequate treatment generally aggravates the condition. Early splinting in a semi-flexed, light form-fitting plastic vinylite splint affords support, minimizes the edema and leads to earlier mobilization.

It must be recognized that there may be persistent swelling of an interphalangeal joint following a severe sprain. Voluntary activity with the use of elastic bands and dynamic splints minimizes permanent disability in such cases. Forceful passive, overenthusiastic manipulation only prolongs the disability and may cause permanent irreversible joint damage. Subsequent capsulectomy on a contracted joint is a poor substitute for good initial care, offering only limited rehabilitation and fair restoration of useful joint motion.

Tendon Injuries

Tendon injuries are most often associated with wounds of the tidy lacerated type. The diagnosis of tendon injury is made on the basis of loss of voluntary motion of a specific joint, or of the abnormal stance or position of the involved digital segment. One does not need to probe or explore (which might further contaminate or traumatize the wound) to look for the cut ends of tendons before undertaking repair of the wound. After restoration of continuity of the tendon, adequate dressings and proper splinting are essential. For support of repaired flexor tendons, a light crowned dorsal plaster splint is used to keep the wrist in moderate flexion and the fingers in a neutral position for four weeks. For protection of repaired extensor tendons, a volar plaster splint is applied to dorsiflex the wrist and to support only the injured portions of the involved digits in extension for a similar period.

Following the splinting period, voluntary exercises with a flat rubber sponge, a piece of foam rubber and a rectangular wooden block are indicated. Subsequent use of elastic bands and dynamic clockspring splints should assist voluntary activity to mobilize residual joint stiffness. Early return to work is desirable, since this activity is of considerable assistance in restoring or maintaining joint mobility and the gliding function of the repaired tendon apparatus. Passive manipulation, heat and soaks are to be eschewed.

Burns

In treating injuries caused by burns of the hand, general supportive treatment of the patient is first in order. The burn and surrounding areas should be thoroughly cleansed with soap, water and pHiso-Hex® under aseptic conditions, and the next steps are excision of devitalized tissue and the application of a fine mesh gauze impregnated with neomycin ointment in beeswax, massive fluff dressings, kerlix rolls and moderately snug stockinette bandage. After immobilization of the forearm, hand and digits in the position of function, the hand should be elevated on pillows. Dressings are changed infrequently, usually not more often than every three to six days. Healing is promoted and the burned areas prepared for grafting by subsequent dressings, further mechanical cleansing, debridement and washing with Bunnell's solution.*

From the very first dressing, special attention should be directed toward early skin grafting in order to get the burns healed, and to the proper splinting to prevent or minimize wrist and digital deformities. Once skin cover is accomplished, particular care should be given to the special position of function, maintaining a good thumb cleft, a dorsiflexed wrist and semiflexed position of the fingers. Ultimately, various reconstructive operations can be carried out as necessary for improvement of function—more satisfactory skin cover to the dorsum of the hand, thumb and fingers; more skin in a contracted thumb cleft; arthrodesis of the middle joints in the position of function for severely contracted proximal interphalangeal joints of the fingers; and capsulectomy of the metacarpophalangeal joints to provide flexion of the fingers for pinch and good grasp.

Following healing and various surgical procedures, voluntary exercises, dynamic splints, and supportive measures contribute toward early restoration to useful activity.

Infected Wounds

Dealing with infected wounds requires elevation, dressings under sterile technique and maintenance of the position of function in order to salvage maximum function and to avoid severe disabling crippling. For preventive and medicolegal reasons, tetanus toxoid or antitoxin, whichever is indicated, should be considered in all cases. Systemic antibiotic therapy should be carried out only when smears, cultures and sensitivity tests indicate the value of specific drugs. Minor infections of the hand are still frequently seen in clinical practice. Despite antibiotics the more severe infections leading to permanent disability do occur with regularity. The more severe wound infections are associated with puncture wounds or those hand wounds closed primarily where attention to detail or aseptic technique has left something to be desired.

Puncture wounds may cut into a tendon sheath or one of the hand spaces (thenar and mid-palmar space) or a digital joint. In those sites contamination finds ideal conditions for growth and spread. Human bites are a common source of infection and generally introduce a wide range of flora. Septic phlebitis in the upper extremity is often either not recognized early or is inadequately cared for. One should utilize elevation, moist dressings of glycerin and zephiran solution, and support with massive fluffs, dressing pads and light kerlix bandages, as described for burns. Full supination of the forearm usually achieves desired dorsiflexion of the wrist, and a massive thumb cleft dressing keeps the thumb from contracting to the side of the hand. Soaks, particularly with the hand dependent, are not advisable because they entail risk of swelling,

*Acetic acid 0.5 per cent, glycerin 20 per cent, in benzalkonium chloride (Zephiran®) 1 to 2,000 aqueous solution.

edema and contamination. Little of value can be found in excessive heat, either in the form of hot water or bakes.

There is a high incidence of the so-called rheumatoid flare reaction with swelling, pain, stiffness and contracture of the hand and fingers seen following surgical procedures, either primary or reconstructive, on patients with some degree of pre-existing Dupuytren's involvement in the palm or of rheumatoid disease in the hands. This leads to prolonged temporary disability and often irreversible joint stiffness. The local reaction may be minimized by observing the preexisting pathologic condition and instituting prompt treatment. Elevation, temporary splinting in as near the position of function as possible and adequate use of analgesic drugs and corticosteroids are of value until healing is complete.

Voluntary exercise should be begun immediately after healing to minimize and clear the local reaction. The therapist should encourage the patient to use his hand.

Vasomotor Disorders

Vasomotor disorders associated with trauma to the upper extremity make up a bizarre symptom complex, variously called causalgia, reflex sympathetic dystrophy (minor causalgia), Sudeck's atrophy (post-traumatic osteoporosis) and shoulder-hand syndrome (chronic traumatic edema). This syndrome—characterized by an overactive sympathetic nervous system, superficial pain exceeding the expected, and hyperesthesia of the involved part—results from a shunting of impulses from the sympathetic to the sensory fibers of an injured nerve.

There may be a variety of irritative causes, traumatic, circulatory and inflammatory. Signs and symptoms are paroxysmal burning superficial pain (made worse by movement, light touch, or temperature changes), aggravated by disturbing the patient's environment, hyperesthesia, increased sweating, varied vasomotor changes (vasodilatation, or ultimately a cold cyanotic extremity), swelling, joint stiffness (disuse), and spotty osteoporosis.

Causalgia itself is a rare disorder associated with partial division or bruising of a peripheral nerve or its involvement in scar. A broader group of vasomotor and trophic conditions is more frequently seen. These conditions fall into the category of minor causalgia, Sudeck's atrophy or shoulder-hand syndrome. The injury may be trivial, the symptom complex generally developing in association with nervous or psychic manifestations. This symptom complex is extremely difficult to classify. The clinical picture is generally incomplete and extremely variable, and the symptoms may be in the process of either resolving or becoming more severe. Characteristically, one finds an injured hand from a crush, contusion, minor fracture, puncture wound, burn or infection, associated with edema and a low threshold or phobia of pain (resulting from touch as well as spontaneous pain from emotional causes) leading to stiffness of the hand, increased sweating, nervousness, fine tremor, smooth glossy skin and local atrophy. There is an early onset of pain; trophic changes appear within three or four weeks.

Extreme caution should be exercised not to place the stigma of a diagnosis of reflex sympathetic dystrophy until that diagnosis is reasonably certain. The vast majority of patients observed in one's office may present aspects of this symptom complex that will serve as guides to an early beginning of prophylactic treatment to prevent the development of prolonged disability.

As to treatment: the various post-traumatic dystrophies and vasomotor disorders are treated in a similar manner. Early prophylactic measures may forestall the development of disability in contusions, sprains or minor fractures.

Treatment may be divided into three parts: Orthopedic measures, mental suggestion and measures to relieve the pain and break the nerve reflex vasospasm.

Orthopedic measures. The limbs should be splinted and elevated to stop the pain and edema before they develop. Splinting, for two or three weeks, of only the involved part rests the limb, prevents swelling, relieves the pain and leads to early active use. Swelling and soreness will subside as the patient actively uses the limb. It has been noted that even when the so-called minor joint injuries are left unsplinted, continuous movement may cause swelling and pain, leading to the development of aspects of the syndrome.

Mental suggestion. The patient must be convinced that pain and swelling will be controlled by early rest, followed soon by active use. Since the patient may easily adopt a "disability" state of mind, with pain spreading throughout the limb and stiffened joints, it is important for the therapist to achieve a relationship with him in which wholesome suggestive treatment can prosper. The patient must exert himself to climb out of the nervous predicament. His reward should be getting well rather than remaining disabled. Early occupational therapy, creative endeavors and encouragement of the patient to proceed with the use of his hand are most efficacious.

Simply referring the patient to physical therapy may give rise to suggestions of disability. It further

shifts the responsibility of getting well to the physical therapist rather than making the patient reliant on his own efforts. Forceful manipulations only aggravate the previous reflex arc and lead to further swelling, pain and stiffness.

Relieving pain breaking the nerve reflex vasospasm. Analgesic medication, sympathetic depressant medication, ganglionic blocks and direct surgical attack (sympathectomy) are measures that may be called for. In the case of severe crush injuries, early stellate block even at the time of primary repair, may prevent a reflex arc and avoid a pernicious situation. It is recommended that this treatment be done in the operating room immediately following primary repair.

It appears advisable to commence treatment in these causalgia-like states as soon as they are suspected, to prevent joint stiffness, the pain arc, disassociation from the brain and the extension to higher levels after which the situation may become irreversible.

Extensive Trauma of Digits

In cases of extensive severe trauma of digits, although the surgical objective is to preserve as much of the involved digits as possible and yet provide satisfactory skin cover, circulatory inadequacy is the limiting factor of survival. Deleting a portion of the digit may be clearly indicated. Extensive crush injuries may present the problem of primary salvage of a digit or portion of the hand that has been incompletely amputated by the injury. Filet of viable tissue may afford maximum salvage of tissue not only for the involved digit or the hand, but to provide serviceable full thickness skin flaps for cover of vital structures or give serviceable cover to a denuded portion. Especially in middle-aged industrial workers, filet is a useful procedure in deleting non-functioning portions of an injured hand, for it provides satisfactory cover to adjacent portions of the hand and obviates stiffness of the uninvolved portions. This method has the added advantage of returning the patient to useful work after a minimum period of temporary disability. It is of considerable economic importance to all concerned.

Accurate Case Records

Another very important responsibility of the reconstructive surgeon or hand specialist is that of an accurate record of each case. One must set up a file, include an accurate history, and establish a series of progress notes. In many cases there are several etiological factors. There may have been a series of injuries or even basic underlying disease processes, such as rheumatoid arthritis or Dupuytren's contracture, which may complicate the present clinical picture. The patient's course and progress during the convalescence and rehabilitation period can be observed from time to time. Records of objective findings, loss of parts, limitation of motion, diminished sensation and weakness of grip, as well as a record of the subjective findings, with notes on the degree of severity and the influence they have on the patient's response to activity and work load, are necessary for a proper evaluation. The significance of the nonindustrial and nonrelated objective and subjective findings in the extremity can be determined. An ultimate work evaluation, record of the factors of permanent disability (objective and subjective), and estimate of need for further subsequent medical care or treatment, can then be offered. Besides their value in therapy, records of this kind can be of great importance to the industrial insurance carrier and from a medico-legal standpoint in specific cases.

Considerable improvement can be accomplished with the multitude of available reconstructive procedures. Tendon grafts may provide useful motion to digits with adequate skin cover, nutrition, and sufficient range of passive joint motion. Tendon freeing and capsulectomy may help in the mobilization of joints to improve the range of digital motion. Osteotomy and bone grafts may improve the bony alignment and stability of the hand and increase the strength of grip. Nerve repair and even nerve grafts may be carried out to restore sensation and afford recovery of muscle function, materially lessening ultimate disability. A number of plastic procedures may be employed to relieve flexion contractures and provide more satisfactory skin cover. The specific procedure must be carefully chosen before operation is begun and there must be reasonable prospect that it will improve function.

Recent developments in partial prostheses and the reconstructive island pedicle transfer for sensation to a vital portion of the thumb or index finger are of value in selected cases.

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REFERENCES

1. Bunnell, Sterling: Surgery of the Hand, 3rd ed., J. B. Lippincott, Philadelphia, 1956.

2. Pratt, Donald R.: Athletic Injuries of the Hand and the Digits, Clinical Orthopedics No. 23, 1962, pp. 100-113.

3. Rank, B. K., and Wakefield, A. R.: Survey of Repair as Applied to Hand Injuries, E. and S. Livingstone Ltd., Edinburgh, 1963.

4. Wilson, John L., and McDonald, Joseph J.: Handbook of Surgery, 2nd ed., Lange Medical Publications, Los Altos, California, 1964, pp. 463-489.

Parasitology in California

A Changing Picture Owing to Changes in Population and Environment

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■ *The changing population in California produced by increased migration from other parts of the country and immigration from foreign countries, and by increased foreign travel, has altered the incidence of parasitic infections.*

Variations in the environment due to increased areas of land under irrigation, urbanization, industrialization, variations in the numbers of animals and insects and changing dietary habits have also effected changes.

With the great influx of persons into our state, physicians should be continually aware of the influx of parasites along with them. These parasites may produce disease in the individuals, may cause small outbreaks or epidemics where environmental conditions foster the propagation of these parasites.

CALIFORNIA'S rapidly growing population has brought with it an increasing incidence of parasites and diseases which were either non-existent or extremely rare in the past, and Californians who go abroad may return with some of these unusual diseases. California is the center for many international corporations whose employees are exposed to tropical and parasitic diseases. This group may return with such unusual conditions as filariasis, schistosomiasis, amebiasis, malaria and many others. Since travelers from abroad or immigrants are becoming more numerous and more and more Californians are visiting foreign lands, it is timely to draw attention to the rising incidence of these bizarre disorders.

Travel and immigration are not the only factors which are changing the picture of parasite infestation in humans. Great changes are taking place in the environment itself, so that disease processes previously absent may now become endemic. The ever-increasing use of irrigation raises the humidity and produces constantly moist earth so that hookworm infestation and strongyloidosis may become en-

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demic. Since the snails that carry the organisms are present in our rice fields and other irrigation projects, we face the possibility of an endemic focus of schistosomiasis. So far as human schistosomiasis is concerned, no known endemic area exists in the state, but certainly bird schistosomiasis is on the increase with the resulting increase in "swimmer's itch"[5] in human subjects. Undoubtedly many cases of unexplained eosinophilia are due to this cause.

Another factor in the changing picture of disease is our eating habits. The advent of frozen dinners and other precooked foods has increased the incidence of enteric infections, and the eating of rare or raw beef has caused an upturn in the incidence of tapeworm infection.

Not only are we experiencing changes in human population, the kinds and numbers of animals also are changing. As to wild animal life this is particularly noticeable among birds—the increase in numbers of pigeons and the appearance of starlings. It has been pointed out that cryptococcus infections are carried by pigeons, and the ubiquitous starling, along with bats and other flying creatures, carry histoplasmosis.

Pets and infections due to pets are on the increase. The disease known as visceral larva migrans occurs when persons, mostly children, contract animal roundworm infections. The dog and cat ascaris *(Toxocara canis* et *T. Cati)* is the most frequent source of this disorder. The eggs of these parasites are deposited in a garden or sand box where they mature and infect children eating dirt or food contaminated with dirt. The larvae of these worms migrate through the tissues and become "lost." As a rule they do not pass through the normal channels to the lung and back to the bowel, but may migrate into almost any organ, including the eye, where they may cause blindness.[1] Dipylidiasis is a disease that is caused by dog tapeworm *(Dipylidium caninum)* infection of humans. Recently we reported two such cases.[9] This worm's life cycle requires the flea as an intermediate host. The flea ingests the tapeworm egg and after the larva of the worm passes through its cycle in the flea, the dog becomes infected by eating the flea. It is thought that children who kiss dogs or are frequently licked about the face and hands by dogs may acquire the infection by the deposition of fleas or parts of flea onto the child by the dog's saliva.

Changes in the industrial picture are producing a change in disease patterns, but so far as is known this has not greatly affected parasitic infections other than in occupations necessitating travel in and out of this country, such as farm labor by Mexicans who annually bring a few cases of malaria, tapeworm, ascaris and other parasitic infections across the border. These are certainly not in epidemic proportions but are of great interest to parasitologists and epidemiologists. Migratory labor camps are potentially foci of disease which may spread into the neighboring community.

Data on studies of stools recorded in the Tropical Diseases Laboratory at the University of California Medical Center in San Francisco based on over 2,000 examinations yearly do not indicate any specific trend in morbidity because of the relative rarity of parasitic infection, but more species of parasites have been noted in recent years than ten years ago. Of course, stools sent to the Tropical Diseases Laboratory are from a selected group of persons, many of whom are suspected of having disease. Others are being screened because of recent work or travel in the tropics. The incidence of disease in this group does not reflect an accurate picture in the general population. It is my clinical impression, from patients seen, that there is a general although still very small increase in the incidence of parasitic disease. Since only malaria and amebiasis are reportable, no statistics are available in other parasitic infections. It is the principal point of this paper to stress the importance of the appearance of these relatively rare conditions so that they will be more promptly recognized and treated.

Routine examination of the stools of food handlers at the University of California Medical Center were carried out in 1961 and 1962. Twenty-four of 216 examined in 1961 and 22 of 247 examined in 1962 had stools that were positive for potentially pathogenic organisms. Only two cases of *E. histolytica* were noted, both in 1962. This group of 463 food handlers probably had a higher incidence of parasitic disease than the general population due to a high proportion of Filipinos, many of whom had recently immigrated.

Many of the specimens on which the report was positive were not associated with illness. The organism of highest incidence was *E. coli,* which was seen in 16 cases. *E. nana* and Trichuris were observed in 14 cases each, hookworm in three, strongyloides in two, and tapeworm, Ascaris, Giardia, Trichomonas and *I. bütschlii* in one case each. There were no recorded cases of pinworm, which should be relatively high, but had peri-anal swabs been examined it is probable that pinworm would have been found in many cases. Pinworm eggs are not often found in the stool. Peri-anal scotch tape pads are essential for accurate diagnosis of this condition.[4]

Amebiasis

Amebiasis, in general, would appear to be decreasing. However, in state institutions, particularly mental institutions housing the mentally deficient, the incidence is still high. In 1933 Johnstone[6] made extensive studies and from data on 1,000 prisoners at San Quentin he estimated the incidence of amebiasis in

the general population of California at about 8 or 10 per cent. Adequate data for determining the incidence in the general population are not available, but from meager statistics and the overall findings in the stool examinations done in the Tropical Diseases Laboratory, it appears that the incidence of *E. histolytica* in the San Francisco Bay area is in the neighborhood of 1 per cent. To be conservative, we have indicated that the incidence of *E. histolytica* in the general population of California is certainly less than 3 per cent, probably in the neighborhood of 1 per cent or less. This incidence includes all cases, whether symptomatic or asymptomatic. It is supported by Brown's[2] study in 1960 of military personnel at four bases in California.

It is well to remember the incidence of amebiasis is directly proportional to the degree of fecal contamination of the food. This is also true of the incidence of viral hepatitis. Hence in dealing with outbreaks of viral hepatitis the stool should be carefully examined for amebic infection as well, and it should be borne in mind that communities about state hospitals are likely to have a higher incidence of amebiasis than others. Amebiasis in most cases is asymptomatic, or the symptoms are so mild that the person affected may not seek medical attention. For that reason, routine stool studies should be done on persons from these highly endemic areas to pick up "carriers."

Malaria

California is a keg of powder when it comes to malaria. There are numerous anopheline mosquitoes in the Central Valley and if a sufficient number became infected an epidemic of human cases could occur. Fortunately, with modern treatment the disease could be controlled in the individual cases and the foci of infestation in the community could be wiped out. But it is well for us to be alert.

An excellent example of a small epidemic of malaria in California is the group of cases reported in 1954 when a Korean veteran had a relapse of *vivax* malaria while camped for only three days near a girls' summer camp.[3] It is surmised that this one individual must have infected many mosquitoes, which in turn infected 34 campers. The fact that such an outbreak could be brought about from one infected person in so short a time emphasizes the importance of continual vigilance, prompt treatment and isolation.

Schistosomiasis

Schistosomiasis to most of us is a disease which exists well over the horizon, and is never expected to occur in California. However, during the past year I have seen three cases, all in farm laborers, two of whom were from Puerto Rico and one from Egypt. Obviously these persons did not acquire the disease in California. However, the detection of their disease was difficult, and probably there are many more such cases which are not detected. With improper sanitary habits it is possible that in the future we will find schistosomiasis in some person who has never left California.

Most[7] reported four cases of schistosomiasis in travelers returning from abroad. They had become infected while in Egypt on "economy tours." They bathed in hotels that used water from rivers or irrigation ditches to fill their bathtubs. Since the most important phase of parasitology is prevention, we must practice good prevention by warning our patients to avoid swimming or bathing, even if it is in hotels, in water that has not been properly treated.

Tapeworm

Most of the cases of tapeworm infestation we see in California are acquired abroad. I have treated a business man who apparently became infected in the South Pacific, a stockbroker from Europe, two doctors' children from France, a teacher from France and a defense worker from Algeria. However, I recently saw two cases of *Taenia saginata*, apparently acquired by eating rare hamburgers at a hamburger stand in Palo Alto. Our modern sewage disposal systems do not destroy *Taenia* eggs. Therefore, cattle grazing in the lush pastures surrounding sewage disposal plants may acquire *Cysticerosis bovis*, and if their tissues are eaten rare or raw we must expect to find some tapeworms.

Hookworm and Strongyloidosis

Seventy-five years ago we had an endemic area of hookworms here in California—in the gold mining region about Grass Valley. Why? The answer is simple. The only place hookworm was endemic in England was in the tin mines of Cornwall where the moist warm earth beneath the ground is ideal for the development of the larva. Miners frequently defecated in the mine tunnels. When our gold mines in the Grass Valley area were recruiting miners, many migrated from Cornwall and brought hookworm with them. Changes in the economy and in sanitation have wiped out the endemic foci.

In April 1962 a 12-year-old boy was admitted to the University of California Hospital with a diagnosis of probable eosinophilic leukemia. He had a leukocyte count of 17,000 per cu mm with 36 per cent eosinophils. Stool examinations were made and a massive infection of Strongyloides was discovered. Once this infection was cured the blood cell count returned to a normal range and general debility cleared. Near Tracy where this boy lived we

took a number of earth samples around irrigation ditches close to his home but were unable to demonstrate a focus of infection. Neither other members of his family nor his dog were infected. We have dealt with two other cases of Strongyloides infection from the same general area but have been unable to locate an endemic focus. As I have pointed out, increased areas of irrigation have produced areas of continuous moisture where almost desert aridity existed before. Certainly in some of these areas endemic hookworm or strongyloides may develop unless proper hygienic and public health measures are followed.

Ascaris

Ascaris is still a rare condition in California, but infected persons from out of state occasionally come to attention here. I recently observed two unusual cases.

One was that of a young Filipina who died suddenly in the recovery room following the delivery of a child. At autopsy a male ascaris was found to have migrated into the glottis, closing the airways and causing anoxia. Undoubtedly the infection had occurred in the Philippines. At autopsy it was the only worm found, and since it was a male it was impossible to detect by stool examination.

The second case was that of a young woman from Central America with peculiar "functional" gastrointestinal complaints. Roentgenograms demonstrated three worms in the bowel. As stool examinations were negative for ova, it was assumed all the worms were male. Two of the worms, both male, were recovered; the third worm was not recovered. Subsequent x-ray studies showed no evidence of worm.

Filariasis

Filariasis is another rare condition sometimes seen in California. Many of the members of the armed services serving in the South Pacific during World War II became infected. These infections are now probably all "burned out," but we do occasionally see an individual with filariasis recently acquired in the tropics.

Onchocercosis is common in Guatemala and other Central American areas. Patients from these areas should be examined carefully for nodules about the scalp, face and neck.

In 1956[8] I observed a case of loaisis in the daughter of a missionary from Central Africa, and in 1959 a second case, this time in a mining engineer who had been prospecting for diamonds in Central Africa. In both cases there was good response to Hetarazan therapy.

In conclusion, I would like to emphasize that changing population and changing travel habits are bringing increasing numbers of parasitic infections into California. Physicians should be aware of this in order to advise patients on means of preventing parasitic infections while abroad, and they should attempt to detect parasitic infections early in order to adequately treat and to prevent development of endemic foci.

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REFERENCES

1. Beaver, P. C.: Visceral and cutaneous larva migrans, U.S. Public Health Report, 74:328-332, April, 1959.

2. Brown, R. L., and Garber, M. J.: Prevalence of intestinal protozoa in adults at four military bases in California, Amer. J. Tropical Med. & Hyg., 9:262-264, May, 1960.

3. Brunetti, R.: Outbreak of malaria with prolonged incubation period in California, a non-endemic area, Science, 119:74-75, Jan. 8, 1954.

4. Holmes, DeF. T., and Sherrer, J. W.: The incidence of *Enterogins vermicularis* in non-institutionalized children in Dayton, Ohio, J. Parasitology, 48:783, Oct., 1962.

5. Hunter, G. W. Jr.: Schistosome dermatitis in Colorado, J. Parasitology, 46:231-234, April 1960.

6. Johnstone, H. G., David, N. A., and Reed, A. C.: A protozoal survey of one thousand prisoners, J.A.M.A., 100: 728-731, March 11, 1933.

7. Most, H., and Levine, D. I.: Schistosomiasis in American tourists, J.A.M.A., 186:453-457, Nov. 2, 1963.

8. Thompson, J. H.: ACTH as an adjunct to the treatment of Loaisis, Amer. J. Trop. Med. and Hyg., 5:1103-1105, Nov., 1956.

9. Thompson, J. H.: Human *Dipylidium caninum* infection, J. Parasitology, 49:402, June, 1963.



The Treatment of Fractures of the Mandible

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■ *One hundred and eleven cases of mandibular fracture in 67 patients who were seen at the San Francisco General Hospital from 1960 to 1962 were reviewed.*

With the exception of two cases in which displaced fragments interfered with the mandibular range of motion, condylar fractures were successfully treated with closed reduction. Undisplaced fractures of the angle were treated successfully by intermaxillary fixation alone, but the significantly displaced fractures were treated by open reduction and interosseous wire fixation. Fractures of the anterior body and midbody were usually treated with closed reduction if adequate teeth were present for satisfactory intermaxillary fixation. Some fractures of the anterior body, particularly those in the region of the symphysis require open reduction because of the strong pull of the muscles in that area.

In this series of patients, clinical infection and non-union were most commonly associated with fractures communicating with teeth. If open reduction is necessary, the results in this series suggest that it should be delayed until the oral tract left by extraction is healed.

Prophylactic antibiotics did not appear to be of value in preventing infection or non-union in this small series of patients, although sufficient data were not available for a statistical conclusion.

THIS PRESENTATION is a review of experience with 111 mandibular fractures in 67 patients with regard to the indications for open reduction, the use of antibiotics, and the management of teeth in the line of fracture. The material of the study was drawn from 260 patients with acute maxillo-facial fractures who were admitted during the past three years at the San Francisco General Hospital — 260 with acute maxillo-facial fractures. One hundred and forty-six of these patients were treated on the University of California Plastic Surgery Service (Table 1). In this latter group, there were 78 patients with fractures of the mandible. Eleven of these 78 patients were deleted from the study, seven because they were lost to follow-up before treatment could be evaluated and

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four because medical contra-indications prevented procedures to immobilize the fractures.

Thirty-five of the 67 patients in this study had bilateral fractures. Five patients had two fractures on the same side and two patients had three separate fractures. Fifty of the patients were male; 17 were female. The average age of the patients was 34 years. Forty patients were injured in fights, 13 in automobile accidents, three in falls, and 11 in miscellaneous or unknown incidents. Concomitant injuries are shown in Table 2.

Condylar Fractures

There were 20 condylar fractures in 20 patients (Table 3). Eighteen of these patients were treated with closed reduction by intermaxillary fixation which brought and held the teeth in normal occlusion for four weeks. Early guided motion was allowed to prevent ankylosis at the temporomandibular joint. Satisfactory functional results were obtained in all of these 18 patients, supporting the belief that condylar fractures (with the exception of those that lock the temporomandibular joint) can be effectively treated by intermaxillary traction alone.[1,5] Two patients were treated with open reduction. In both cases the condylar head was greatly displaced, in one patient to the extent that it prevented movement of the jaw. In the latter case the condylar head was resected. Results were satisfactory in both patients.

Fractures of the Mandibular Angle

Thirty-two patients had a total of 36 fractures of the angle of the mandible. Seventeen of these fractures were treated with closed reduction utilizing intermaxillary fixation for six weeks. These 17 fractures healed. Nineteen fractures were treated by open reduction with interosseous wiring in addition to intermaxillary fixation. In 16 of these 19 fractures there was displacement of the bones. In the three cases in which the bones were not displaced, the patients were edentulous. In one of the 19 cases in which open reduction was used, non-union developed. The remaining fractures healed satisfactorily (Table 3).

Our approach to fractures of the angle is governed by whether or not there is a significantly displaced posterior fragment that canot be controlled by closed reduction. In the majority of displaced fractures of the angle, no tooth is present in the posterior fragment and muscle is interposed in the fracture. These displaced fractures are treated with open reduction.

Midbody Fractures

There were 25 midbody fractures in 19 patients. Four fractures were treated with closed reduction and these healed. Twenty-one fractures were treated with open reduction and interosseous wiring. Nineteen of these fractures were in edentulous patients and the two remaining were in patients with multiple, displaced mandibular fractures that were not otherwise reducible. In two of the patients treated with open reduction infection developed and the fractures did not unite. The remaining 19 fractures healed satisfactorily (Table 3).

The most important factor in determining the treatment of fractures of the midbody of the mandible is the presence of teeth. If one segment of the fractured jaw is edentulous, significant displacement may be difficult to reduce and the reduction may be difficult to maintain. On the other hand, considerable displacement of a midbody fracture in a patient with teeth can usually be reduced by closed manipulation and intermaxillary fixation.

Fractures of the Anterior Body

Thirty fractures of the anterior body occurred in 30 patients. Twenty-four of these fractures were

TABLE 1.—*Incidence of Maxillo-Facial Fractures Seen in the San Francisco General Hospital,* 1960-1962*

Location of Fracture	*Number of Patients*
Mandible	65
Mandible, maxilla-zygoma	8
Mandible, maxilla-zygoma, nose	3
Mandible, nose	2
Maxilla-zygoma	52
Maxilla-zygoma, nose	7
Nose	8
Frontal bone	1
Total	146

*Plastic Surgery Service, University of California Medical School.

TABLE 2.—*Incidence of Associated Injuries in Patients with Mandibular Fractures*

Associated Injuries	*Number of Patients*
Other facial fracture	12
Fracture of the skull	5
Fracture of an extremity	10
Laceration	22

TABLE 3.—*Results of Closed and Open Reductions of Mandibular Fractures*

Location of Fracture	*Number of Fractures*				
	Total	*Closed Reduction*	*Open Reduction*	*Healed*	*Non-Union*
Condylar	20	18	2	20	0
Angle	36	17	19	35	1
Midbody	25	4	21	23	2
Anterior body	30	24	6	26	4
Total	111	63	48	104	7

treated with closed reduction and non-union developend in three instances. Six of the fractures of the anterior body were treated with open reduction and interosseous wiring; non-union developed in one. The remaining fractures healed satisfactorily (Table 3).

It is our belief that healing of the anterior mandible is adversely affected by the relatively poor blood supply to that area and that achievement of exact occlusion and bony apposition is essential. Fractures of the anterior body, even when displaced, can usually be treated with closed reduction if teeth are present for adequate intermaxillary fixation. Open reduction is reserved for cases in which displacement cannot be overcome and and proper occlusion cannot be obtained with closed reduction. This occurs most commonly in fractures of the symphysis menti because of the strong pull of the geniohyoideus muscles.

TABLE 4.—*Relationship of Teeth in the Line of Fracture to the Incidence of Infection and Non-Union*

Location of Fracture	Number of Fractures			
	Total	Infection	Non-Union	Healed
Condyle	20	0	0	20
Angle				
With teeth	6	2	1	5
Without teeth	30	1	0	30
Midbody				
With teeth	5	2	1	4
Without teeth	20	3	1	19
Anterior body				
With teeth	11	3	4	7
Without teeth	19	0	0	19

TABLE 5.—*Relationship of the Type of Treatment to the Incidence of Infection and Non-Union*

Treatment	Number of Fractures			
	Total	Teeth in the Line of Fracture	Infection	Non-Union
Closed reduction				
Without extraction	59	9	2	2
With extraction	4	4	1	1
Open reduction				
Without extraction	39	0	3	1
With extraction	9	9	5	3
Total	111	22	11	7

TABLE 6.—*Relationship of Prophylactic Antibiotics to the Incidence of Infection and Non-Union*

Treatment	Number of Patients			
	Total	Developing Infection	Developing Non-Union	Healed
Prophylactic antibiotics	38	8	4	34
No prophylactic antibiotics	29	3	3	26

TABLE 7.—*Relationship of Prophylactic Antibiotics to the Incidence of Infection and Non-Union in Patients with Teeth in the Line of Fracture*

Treatment	Number of Patients		
	Total	Infection	Non-Union
Prophylactic antibiotics	11	4	3
No prophylactic antibiotics	11	3	3
Total	22	7	6

Teeth in the Line of Fracture

In 22 patients wtih 22 fractures, teeth were present in the line of fracture (Table 4). Six fractures of the angle communicated with teeth; two of these fractures became infected and one did not heal. Five midbody fractures communicated with teeth; of these, two became infected and one did not heal. Eleven fractures of the anterior body communicated with teeth; three of these became clinically infected and four did not heal.

In the group of 63 fractures that were treated with closed reduction, there were 13 fractures with teeth in the line of fracture. In nine of these fractures the involved teeth were not extracted. In two fractures infection with non-union developed. One fracture healed after clinical infection. Teeth were extracted from the line of fracture in four fractures that were treated with closed reduction. One of these fractures became infected and did not heal.

Of 48 fractures treated by open reduction, nine had teeth in the line of fracture. These teeth were extracted at the time of open reduction. Clinical infection developed in five of these fractures with subsequent non-union occurring in three (Table 5). There were no teeth in the line of the remaining 39 fractures treated by open reduction. In three of these 39 fractures infection developed and in one the fragments did not unite.

The study of this series of patients suggests that extraction before open reduction is less likely to result in infection if the tract left by extraction is allowed to seal before manipulation and interosseus wiring of the fragments are undertaken.

Clinical Infection

Clinical infection occurred in 11 of 111 fractures. In seven of the infected cases there were teeth in the line of fracture. Five of these seven were treated with simultaneous extraction and open reduction; two were treated with closed reduction, accompanied in one instance by simultaneous tooth extraction. In all four of the cases of infection that did not involve teeth, the fractures were compounded into the mouth. One of these four were infected by a splint wire which was passed through the open reduction site. Two others were grossly contaminated and one had gone untreated for ten days. The fourth case was in a child with an associated severe head injury. He

remained comatose, constantly grinding his teeth, and it was impossible to obtain adequate immobilization of the fracture of the jaw.

In the cases in which infection developed, the average time elapsing between fracture and hospitalization was seven days, as compared with 36 hours for the entire group. Perhaps this time factor, associated with poor oral hygiene, contributed to the incidence of infection in these patients.

Antibiotics

Thirty-eight patients in this series were treated with prophylactic antibiotics. Clinical infection in the line of fracture developed in eight, and in four there was non-union. Of 29 patients who received no prophylactic antibiotics, three had clinical infection in the line of fracture and three had non-union at the fracture site (Table 6).

Eleven of the 22 patients with teeth in the line of fracture were given antibiotics prophylactically. In four of these patients clinical infection developed, and in three non-union. Of 11 patients with teeth in the line of fracture who did not receive prophylactic antibiotics, three had clinical infection and three had non-union (Table 7).

Antibiotics were given for various reasons. In some cases administartion was started in the emergency room as a matter of routine by the attending staff. In others they were given primarily because of an associated injury. Patients with severely compounded and contaminated fractures generally were given antibiotics early.

It is apparent that the use of prophylactic antibiotics did not significantly reduce the incidence of infection or non-union in this series of patients. Although it is common practice to treat all patients with mandibular fracture with antibiotics, it is our belief that the use of these agents should be restricted to those cases in which there is massive wound contamination or an abscessed tooth in the line of fracture.

Non-Union

There were seven cases of non-union. Clinical infection preceded non-union in five cases, in four of which there were teeth in the line of fracture and in one there was gross contamination orally. The two cases of non-union without clinical infection were in patients with teeth that were left in the line of fracture. Thus, of the seven cases of non-union in this series, six were associated with teeth in the line of fracture. It is perhaps significant that four of the seven cases of non-union occurred in the anterior portion of the mandible where the circulation is less adequate than in the ramus and body of the mandible.

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REFERENCES

1. Erich, J. B., and Austin, L. T.: Traumatic Injuries of Facial Bones, W. B. Saunders Co., Philadelphia, 1944.

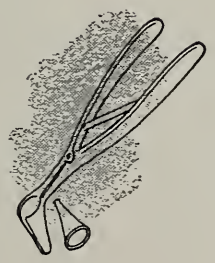
2. Ivy, R. H., and Curtis, L.: Fractures of the Jaws, Lea and Febiger, Philadelphia, 1945.

3. Rowe, N. L., and Killey, H. C.: Fractures of the Facial Skeleton, Williams and Wilkins, Baltimore, 1955.

4. Thoma, K. H.: Traumatic Surgery of the Jaws, C. V. Mosby Co., St. Louis, 1942.

5. Wilde, N. J.: The tolerance of the temporomandibular joint to fracture, dislocation, and associated injury, Plast. and Reconstr. Surg., 25:574-583, 1960.

6. Wilhelm: "Proxeos Totius Medicinae," 1275.



Traffic Safety

California Laws Affecting the Physician and His Patient

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BECAUSE OF THE MANY legal ramifications involved in the present day practice of medicine, it may be helpful to call attention to statutory responsibilities in certain fields where knowledge of the actual laws by the average physician is less than complete. This presentation is concerned with the medicolegal relationships of the physician, the patient and the state as they pertain to the medical aspects of traffic safety.

Relatively few people who wish to drive have medical problems of a nature to make them a hazard on the road; yet the evaluation of the known problems and efforts to detect the unknown constitute a major task on the part of the Department of Motor Vehicles, and indirectly on the part of the medical profession. Without the backing and assistance of physicians, the campaign to protect the public from medically unsafe drivers would be a total failure.

General Consideration Of Driving Licensure

There are specific grounds upon which the Department of Motor Vehicles is required to refuse to issue or to renew a driver's license (Section 12805 of the California Vehicle Code). They are:

- Alcoholism, narcotic addiction or the habitual use of any drug rendering the person incapable of safely operating a motor vehicle;
- Mental illness, idiocy, imbecility and feeblemindedness;
- Epilepsy;
- Other physical or mental defects which would affect driving ability.

An applicant must disclose the existence of any of these grounds when obtaining or renewing his license (V.C. 12800). If he fraudulently conceals this information, his license can be refused (V.C. 12809) or revoked (V.C. 13359). If any of these grounds develop while he has his license, it can be revoked (V.C. 13359). Actually, the Department has the power to immediately revoke a license without a previous medical examination when, on the basis of the driver's mental or physical condition, he would constitute a hazard to public safety (V.C. 13953).

Since most of these grounds involve medical matters, the Department of Motor Vehicles is empowered to order medical evaluations as a part of a driver's examination for licensure (V.C. 12804). Indeed, the Department can order medical examinations even after the license has been granted, to determine if it should be revoked or suspended

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(V.C. 13800). If the applicant fails to submit to an examination or re-examination, his license can be refused (V.C. 12809) or suspended (V.C. 13801) until he complies with the order.

Duty of the Physician to Report Cases of Epilepsy

There are several sections in the California codes which require physicians to report cases of epilepsy and related conditions to the Public Health Offices. Ad. Code, Titles 17, section 2572 states: "Any condition which brings about momentary lapses of consciousness and which may become chronic shall be considered reportable under the term *epilepsy*." (The reporting requirements under H&S code, section 410, apply not only to epilepsy but also to "similar disorders characterized by lapses of consciousness." Therefore, physicians must report cases of epilepsy *and* other conditions associated with lapses of consciousness though not actually epileptic in nature.

While V.C. 12805 states that persons with epilepsy shall not be licensed to drive, V.C. 12806 provides that if a physicial or mental defect does not, in the opinion of the Department of Motor Vehicles, affect the driving ability, a license may be issued. On this basis, it has been the practice of the Department of Motor Vehicles to evaluate each case on its merits and, if possible, to provide the applicant with at least a restricted license befitting his circumstances. When licenses have been revoked on the basis of lapses of consciousness, reinstatement is often provided on a probationary basis when control has become adequate. When this is accomplished, the licensee must furnish periodic reports from his physician to the Department.

Duty of the Physician Concerning Physical and Mental Disabilities Which May Affect Driving Competency

Unlike the situation of epilepsy (including its broad definition noted above), there is no statutory requirement that a physician initiate a report of any other mental or physical defect even though it may significantly affect driving ability. Despite the desirability of doing so under some circumstances, based on public safety, an unconsented disclosure by a physician could well result in a breach of confidence for which he could be subject to civil liability to the patient.

As was noted above, however, the Department of Motor Vehicles has the power to investigate medical matters at just about any time. When a physician is asked by the Department (with the consent of the patient) or by the patient to provide medical information to the Department, it is the duty of the physician to make full disclosure of the patient's medical background as it pertains to his driving ability. A failure to make such complete disclosure when asked may result in civil responsibility on the part of the physician to the patient if injury occurs as a proximate result thereof.

It has been the practice of the Department of Motor Vehicles to supply the examining physician with as much of the medical background as the Department has already obtained in order that the examining physician may render a complete opinion. If the physician, acting as an examiner, is not satisfied with the background information available, he can request further information from the Department.

What constitutes a mental or physical defect which may affect driving ability depends on the circumstances of each individual case. The examining or treating physician must use his own discretion and medical judgment. In his report to the Department of Motor Vehicles, the physician should render, if possible, not only the opinion of the diagnosis, but also an opinion as to the applicant's driving ability as it might be affected by whatever disease or condition he may have.

The opinion of the examining or treating physician is not final. The Vehicle Code provides that the Department of Motor Vehicles make the final decision, although it may be predicated greatly upon the findings and opinions supplied by the physicians (V.C. 14105, V.C. 14110). Therefore, the disclosure by the physician of the medical information at his disposal does not necessarily mean that the patient will be deprived completely of a license. The Department of Motor Vehicles has the power under certain circumstances to issue just about any form of restricted license to fit the needs (V.C. 12813). Finally, V.C. 12806 provides the Department with authority to issue a regular, unrestricted and unconditional license in many cases where the health problem or physical or mental defect does not, in the particular individual, affect his ability to exercise reasonable and ordinary control in operating a motor vehicle.

The reports of examining and treating physicians to the Department of Motor Vehicles are confidential (V.C. 1808). It should be emphasized that the patient, not the Department of Motor Vehicles, is responsible for all medical charges and special expenses involved in establishing driving eligibility.

Although there may be no duty upon the physician to initiate a report to the Department of Motor Vehicles for conditions affecting driving safety other than epilepsy, the physician does have a duty to warn the patient that whatever condition he might have may well affect his driving ability. Failure to warn the patient may result in civil responsibility to the patient or to a third person who may be injured as a proximate result thereof.

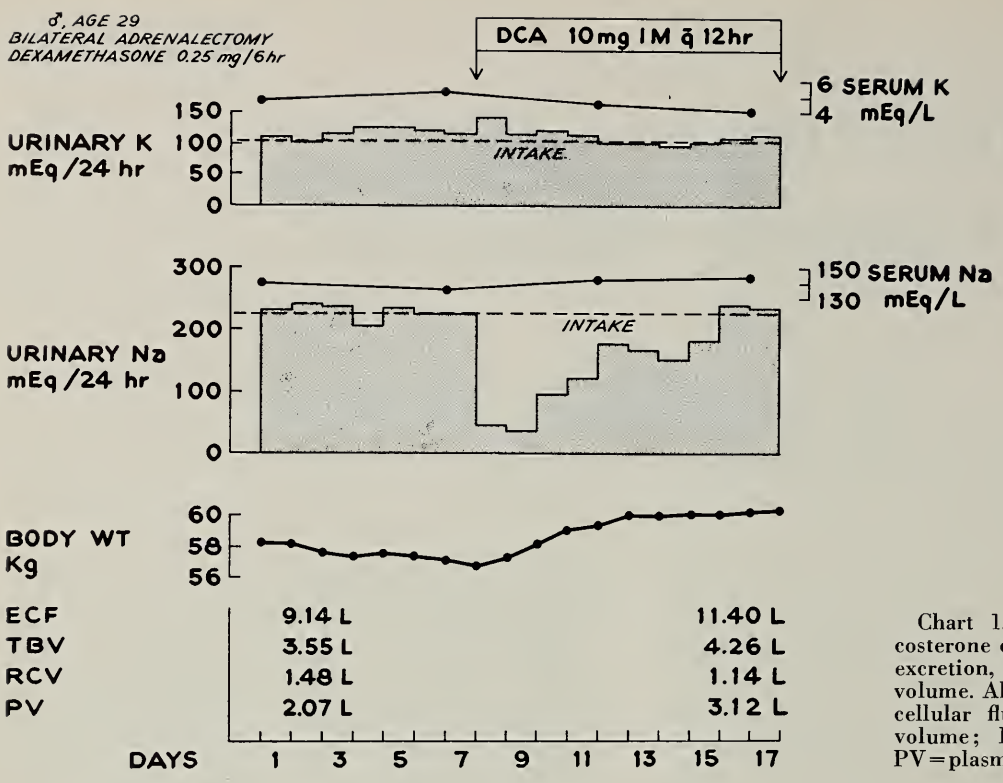


Chart 1.—Effect of desoxycorticosterone on sodium and potassium excretion, body weight, and blood volume. Abbreviations: ECF = extra cellular fluid; TBV = total blood volume; RCV = red cell volume; PV = plasma volume.

hours). In the absence of uremia, failure to concentrate the urine after dehydration and administration of vasopressin may be presumptive evidence of potassium depletion.

The carbohydrate abnormalities that occur in primary aldosteronism resemble those that occur in the "peripheral type" of diabetes mellitus.[19] The blood sugar level is frequently elevated, and the glucose tolerance test curve resembles that found in diabetes mellitus. Insulin levels are increased. With correction of the potassium depletion, carbohydrate metabolism returns to normal. The glucocorticoid effects of aldosterone are negligible at the level of secretion found in primary aldosteronism.

Abnormal circulatory reflexes are frequently present in severe and chronic potassium depletion.[7] These abnormalities are reversible and appear to be uniquely characteristic of primary aldosteronism. Normally, the response to a change in posture from squatting to standing, consists of tachycardia with little or no change in arterial pressure. If decreases in both systolic and diastolic pressure occur after changes of position, without changes in pulse rate, the presence of baroreceptor deficiencies in primary aldosteronism is suggested. Valsalva's maneuver also tests baroreceptor activity. The normal hypertensive "overshoot" and reflex bradycardia following the release of increased intrathoracic pressure fails to occur in these patients. The observation of decreases in blood pressure on postural change, without acceleration in pulse rate, in an untreated hypertensive patient may well be presumptive evidence of primary aldosteronism. The higher blood pressure in the supine position combined with the failure to concentrate urine may well account for the pronounced nocturia and the reversal of the normal diurnal excretion of sodium and water found in these patients (Chart 2). Potassium replacement will correct the abnormal circulatory reflexes.

TABLE 1.—*Plasma Volume Determinations in Primary Aldosteronism*

Patient	*Predicted Plasma Volume (Liters)*	*Observed Plasma Volume (Liters)*	*Deviation Pre-Operative (Liters)*	*Per Cent Post-Operative (Liters)*
1	1.97	3.48	+76	+37
2	2.95	4.37	+48	0
3	1.61	1.97	+22	− 4
4	2.48	3.39	+37	− 3
5	2.25	2.76	+23	+ 4
6	1.91	1.83	+ 5	− 1

Hypertension occurs in primary aldosteronism, and although the cause is obscure a hypothesis can be presented. Blood volume and nervous regulation of arterioles are two factors in determining arterial pressure. The combination of hypervolemia and defects in baroreceptor activity is unique to primary aldosteronism. With diminished reflex control of blood pressure, the mechanical effects of increase in blood volume may be the critical factor in the production of hypertension. There is a decided similarity to patients with autonomic insufficiency.[34] Both have baroreceptor abnormalities and with both

there is a rise in blood pressure when blood volume is increased. After removal of the adrenal tumor, the blood pressure gradually returns to normal, paralleling the restoration of baroreceptor activity and normal blood volume.

The use of anti-aldosterone agents, such as spironolactone, has proven diagnostically useful.[9] Spironolactones block the effect of aldosterone in the nephron. The administration of sufficient amounts of spironolactone should aid in correcting the sodium retention and potassium loss of aldosterone excess. In patients with primary aldosteronism, administration of 1 gm of spironolactone (or 400 mg of spironolactone-A) daily in divided doses for three days results in a sodium diuresis with potassium retention and a return of the serum potassium concentration to normal. Withdrawal of the drug is followed in seven days by a recurrence of potassium loss and hypokalemia. Thus, a low serum potassium concentration which is corrected by spironolactone but which returns to previous low levels when the drug is discontinued, is presumptive evidence of aldosterone excess.

Measurement of the serum potassium concentration is the single most useful initial diagnostic test for primary aldosteronism. However, it must be measured under the proper conditions for correct interpretation. Dietary intake of salt must be normal (greater than 3 gm of sodium chloride) for four days before the determination is made. The importance of sufficient sodium ion is demonstrated in Chart 3. Sodium ions must reach the exchange site in the nephron before the influence of aldosterone can be observed. If only limited amounts of sodium ions reach this site, as when a patient is on a restricted sodium intake, actual potassium retention will occur, even though abundant amounts of aldosterone are present.[9] Serum potassium concentrations will become normal and the abnormalities of potassium depletion will be corrected.

Secondary Aldosteronism

Edematous States. Increased secretion of aldosterone is seen in edematous states, such as cirrhosis with ascites, nephrosis, idiopathic edema, and congestive heart failure. Obviously, the increased secretion is a consequence of the underlying disease process. How does one reconcile the presence of increased aldosterone secretion in an edematous patient when increases in the extracellular fluid normally depress aldosterone secretion? Reduced blood flow or blood pressure in some critical area may well be the mechanism involved.[2] Correction or improvement of the basic disease is usually accompanied by reduction of aldosterone secretion.

In cirrhosis with ascites, the continuing loss of fluid into the abdominal cavity may initiate over-

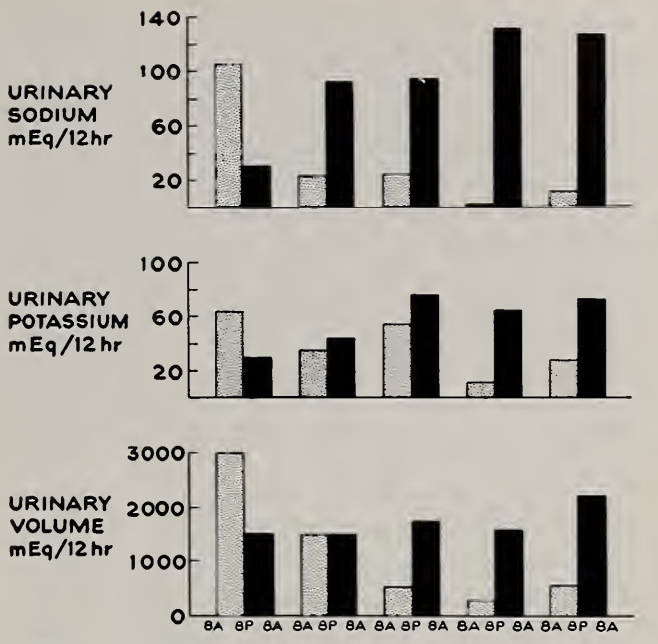


Chart 2.—Diurnal patterns of urinary sodium, potassium and volume in primary aldosteronism.

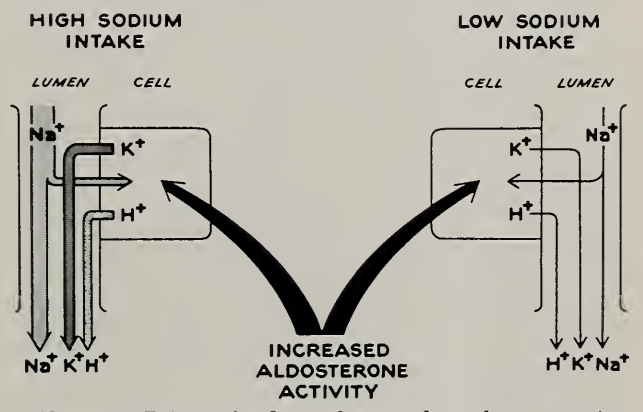


Chart 3.—Effect of salt intake on electrolyte excretion in primary aldosteronism.

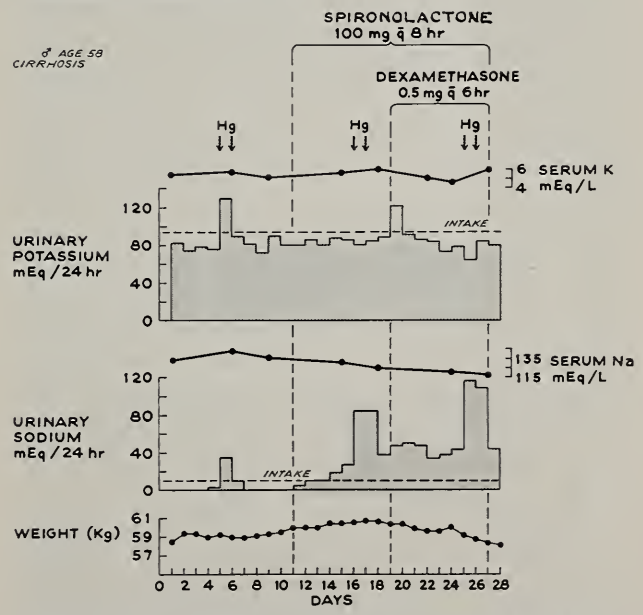


Chart 4.—The effect of diuretic, spironolactone, and dexamethasone in cirrhosis.

secretion of aldosterone resulting in compensatory fluid retention. The glomerular and capillary leaks of nephrosis may provide a similar stimulus to hypersecretion of aldosterone. In secondary aldosteronism of these edematous states, the electrolyte abnormalities of primary aldosteronism do not occur. An explanation for their absences is diagrammed in Chart 3. If aldosterone is to exert its influence in the nephron, adequate sodium ion must reach the exchange site. When sodium retention is greatly increased, little sodium ion reaches this site so that the renal loss of potassium is not observed. Certainly, if enough sodium ion were present in the exchange site, a mechanism for the loss of potassium would be readily available.

An illustration of such a mechanism is given in Chart 4. The data were obtained from a patient who was cirrhotic, had refractory ascites, excessive aldosterone secretion, and no urinary sodium excretion. After equilibration on a controlled diet he was given 2 ml of Mercurhydrin on two successive days. Natruresis was minimal but kaluresis occurred. Mercurial diuretic drugs act on the proximal tubule to interfere with sodium reabsorption. As a result more sodium ions are delivered to the exchange site, and since excessive aldosterone is present a potassium diuresis occurs. The greater incidence of digitalis intoxication in patients with congestive heart failure treated with oral diuretic agents may be related to this potassium-wasting phenomenon.

Administration of spironolactone to the patient, starting on day 11, resulted in only slightly increased sodium excretion. When the same dose of the mercurial diuretic agent was repeated five days later, pronounced sodium diuresis occurred without potassium diuresis. The excessive aldosterone present was effectively blocked, and the additional sodium ions that reached the site of aldosterone activity did not participate to any great extent in the exchange of potassium. The addition of dexamethasone on day 19 further increased the natruretic response to the same dose of mercurial diuretic drug but the continuing blockade of the renal effect of aldosterone prevented potassium loss.

Idiopathic edema is occasionally accompanied by increased secretion of aldosterone. That this syndrome may also occur without increased aldosterone secretion supports the supposition that aldosterone may not be an essential factor. The associated finding of hypokalemic alkalosis in such patients may indicate excessive secretion of other mineralocorticoids.[5]

Non-edematous States. Hypertension is a common finding in nonedematous states with secondary aldosteronism. Increased secretion of aldosterone has been observed in severe essential hypertension and accelerated or malignant hypertension.[16,24] In unilateral renal obstruction, a state similar to primary aldosteronism is occasionally seen.[24,37] These observations have produced two questions: Why is aldosterone secretion increased in hypertension? and How can one distinguish these patients from those with an aldosterone-producing tumor?

An explanation for the increased secretion of aldosterone in these conditions has been suggested.[21,32] Extrarenal occlusion of a renal artery decreases the mean blood pressure to the kidney where the juxtaglomular cells of the afferent arterioles may function as a pressure receptor. Granularity increases within these cells and renin content rises. Renin is a proteolytic enzyme which changes an alpha-2 globulin fragment into angiotensin I, which is further converted into angiotensin II. Angiotensin II is not only a potent vasopressor agent but also a potent stimulator of aldosterone secretion.[22] The excessive secretion of aldosterone may produce effects on the nephron similar to those seen in primary aldosteronism. Aldosterone may be viewed as an undesirable and contributory physiological consequence of the basic disease process.

In accelerated or malignant hypertension diffuse narrowing of the intrarenal arterioles may initiate the same series of events, but it is not known if this is the sole mechanism responsible for the increased secretion of aldosterone.

Certain features distinguish these hypertensive states from primary aldosteronism.[31] Malignant hypertension is an extremely rare occurrence in adult patients with primary aldosteronism—only one such case has been reported.[20] The urinary levels of aldosterone are approximately the same in this group of hypertensive patients and in patients with primary aldosteronism. While serum potassium concentrations tend to be reduced in accelerated hypertension, they infrequently reach the concentrations observed in primary aldosteronism.[12] The serum sodium concentration often provides a useful clue for differentiating between the diseases. In accelerated hypertension, it is usually normal or low, whereas in primary aldosteronism it is increased.[3,12,31] The blood volume is usually depressed in hypertension,[35] in contrast to the hypovolemia of primary aldosteronism. The hypervolemia possibly can be attributed to the generalized vasoconstriction as well as to the natruretic effect of angiotensin in the hypertensive state.[14] The circulatory reflex abnormalities of primary aldosteronism are not found in accelerated hypertension. In our experience, patients with renal vascular hypertension, secondary aldosteronism and hypokalemia respond well to renal artery reconstruction or nephrectomy.

Measurements of exchangeable sodium and potassium may also aid in distinguishing between the two groups. These measurements are usually normal

in severe hypertension.[10] Increased exchangeable sodium and decreased exchangeable potassium are observed in primary aldosteronism.[13]

Aldosterone Lack

Aldosterone lack is characteristic of Addison's disease. It is well known that decreases in blood pressure associated with changes in posture in patients with untreated Addison's disease are corrected by administration of mineralocorticoids. The same is true of patients with autonomic insufficiency and postural hypotension. The symptoms of the latter are frequently improved, although not cured, by treatment with mineralocorticoids.[18] These patients are also similar to patients with Addison's disease in that secretion of aldosterone is low and the usual responses that increase aldosterone secretion, (for example, corticotropin and angiotensin) are blunted or absent.[8] This relatively low and fixed secretion of aldosterone could account for the benefit resulting from treatment with mineralocorticoids.

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REFERENCES

1. August, J. T., Nelson, D. H., and Thorn, G. W.: Response of normal subjects to large amounts of aldosterone, J. Clin. Invest., 37:1549, 1958.

2. Bartter, F. C.: The role of aldosterone in normal homeostasis and in certain disease states, In: Symposium: Water and Electrolytes, Metabolism, 5:369, 1956.

3. Bartter, F. C., Liddle, G. W., Duncan, L. E., Jr., Barber, J. K., and Delea, C.: The regulation of aldosterone secretion in man: the role of fluid volume, J. Clin. Invest., 35:1306, 1956.

4. Bartter, F. C., Mills, I. H., Biglieri, E. G., and Delea, C.: Studies on the control and physiologic action of aldosterone, Recent Progr. Hormone Res., 15:311, 1959.

5. Biglieri, E. G.: Hyperdesoxycorticosteroidism with hypokalemic alkalosis and edema, J. Clin. Invest., 42:917, 1963.

6. Biglieri, E. G., Hane, S., Slaton, P. E., Jr., and Forsham, P. H.: *In vivo* and *in vitro* studies of adrenal secretions in Cushing's syndrome and primary aldosteronism, J. Clin. Invest., 42:516, 1963.

7. Biglieri, E. G., McIlroy, M. B., Naimark, A., and Forsham, P. H.: Altered autonomic nervous system and renal responses in primary aldosteronism, J. Clin. Invest., 41: 1345, 1962 (Abstract).

8. Biglieri, E. G., and Slaton, P. E., Jr.: Adrenal function in autonomic insufficiency, Clin. Res., 12:88, 1964 (Abstract).

9. Biglieri, E. G., Slaton, P. E., Jr., and Forsham, P. H.: Useful parameters in the diagnosis of primary aldosteronism, J.A.M.A., 178:19, 1961.

10. Chobanian, A. V., Burrows, B. A., and Hollander, W.: Body fluid and electrolyte composition in arterial hypertension. II. Studies in mineralocorticoid hypertension, J. Clin. Invest., 40:416, 1961.

11. Conn, J. W.: Primary aldosteronism, a new syndrome, J. Lab. Clin. Med., 45:6, 1955.

12. Conn, J. W.: Aldosteronism and hypertension, Arch. Int. Med., 107:813, 1961.

13. Crane, M. G., Harris, J. J., and Holloway, J. E.: Exchangeable sodium and potassium in primary aldosteronism, J. Lab. Clin. Med., 61:51, 1963.

14. Dustan, H., Nijenson, C., and Corcoran, A. C.: Natriuretic-diuretic effect of angiotonin in essential hypertension, J. Clin. Invest., 34:931, 1955.

15. Flood, C., Layne, D. S., Ramcharan, S., Rossipal, E., Tait, J. F., and Tait, S. A. S.: An investigation of the urinary metabolites and secretion rates of aldosterone and cortisol in man and a description of methods for their measurement, Acta Endocr., (Kbh) 36:237, 1961.

16. Genest, J., Kiow, E., Nowaczynski, W., and Leboeuf, G.: Further studies on urinary aldosterone in human arterial hypertension, Proc. Soc. Exp. Biol. Med., 97:676, 1958.

17. Giroud, C. P. J., Stachenko, J., and Benning, E. H.: Secretion of aldosterone by the zona glomerulosa of rat adrenal glands incubated *in vitro*, Proc. Soc. Exp. Biol. Med., 92:154, 1956.

18. Hickler, R. B., Thompson, G. R., Fox, L. M., and Hamlin, J. T., III: Successful treatment of orthostatic hypotension with 9-alpha-fluorohydrocortisone, N.E.J.M., 261: 788, 1959.

19. Horton, R., Kane, J. P., Biglieri, E. G., Grodsky, G. M., and Forsham, P. H.: Carbohydrate metabolism in primary aldosteronism, Clin. Res., 11:83, 1963 (Abstract).

20. Kaplan, N. M.: Primary aldosteronism with malignant hypertension, N.E.J.M., 269:1282, 1963.

21. Laragh, J. H.: The role of aldosterone in man: evidence for regulation of electrolyte balance and arterial pressure by a renal-adrenal system which may be involved in malignant hypertension, J.A.M.A., 174:293, 1960.

22. Laragh, J. H., Angers, M., Kelly, W. G., and Lieberman, S.: Hypotensive agents and pressor substances: the effect of epinephrine, norepinephrine, angiotension II and others on the secretory rate of aldosterone in man, J.A.M.A., 174:234, 1960.

23. Laragh, J. H., and Stoerk, H. C.: A study of the mechanism of secretion of the sodium-retaining hormone (aldosterone), J. Clin. Invest., 36:383, 1957.

24. Laragh, J. H., Ulich, S., Januszewicz, V., Deming, Q. B., Kelly, W. G., and Lieberman, S.: Aldosterone secretion and primary and malignant hypertension, J. Clin. Invest., 39:1091, 1960.

25. Liddle, G. W., Duncan, L. E., Jr., and Bartter, F. C.: Dual mechanism regulating adrenocortical functions in man, Amer. J. Med., 21:380, 1956.

26. Luetscher, J. A., Jr., and Johnson, B. B.: Observations on the sodium-retaining corticoid (aldosterone) in the urine of children and adults in relation to sodium balance and edema, J. Clin. Invest., 33:1441, 1954.

27. Luetscher, J. A., Jr., Neher, R., and Wettstein, A.: Isolation of crystalline aldosterone from the urine of a nephrotic patient, Experientia, 10:456, 1954.

28. Peterson, R. E.: The miscible pool and turnover rate of adrenocortical steroids in man, Recent Progr. Hormone Res., 15:231, 1959.

29. Simpson, S. A., Tait, J. F., Wettstein, A., Neher, R., Euw, J. V., and Reichstein, T.: Isolierung eines neuen kristallisierten Hormons aus Nebennieren mit besonders hoher Wirksamkeit auf den Mineralstoffwechsel, Experientia, 9:333, 1953.

30. Simpson, S. A., Tait, J. F., Wettstein, A., Neher, R., Euw., J. V., Schindler, O., and Reichstein, T.: Konstitution des Aldosterons, des neuen Mineralcorticoids, Experientia, 10:132, 1954.

31. Slaton, P. E., Jr., and Biglieri, E. G.: Hypertension and hyperaldosteronism of renal and adrenal origin, Amer. J. Med. (in press).

32. Tobian, L.: Physiology of the juxtaglomerular cells, Ann. Int. Med., 52:395, 1960.

33. Ulich, S., Laragh, J. H., and Lieberman, S.: The isolation of a urinary metabolite of aldosterone and its use to measure the rate of secretion of aldosterone by the adrenal cortex of man, Trans. Assn. Amer. Physicians, 71:225, 1958.

34. Wagner, H. N., Jr.: Orthostatic hypotension, Bull. Johns Hopkins Hosp., 105:322, 1956.

35. Walser, M., Duffy, B. J., Jr., and Griffith, H. W.: Body fluids in hypertension and mild heart failure, J.A.M.A., 160:858, 1956.

36. Wintersteiner, O., Vars, H. M., and Pfiffner, J. J.: Chemical investigations on the cortical hormone of the adrenal glands. In: Proc. Amer. Soc. Biol. Chemists, J. Biol. Chem., 105:C, 1934.

37. Wrong, O.: Incidence of hypokalaemia in severe hypertension, Brit. Med. J., 2:419, 1961.

CASE REPORTS

Carcinoma of the Thyroid Following Treatment Of Hyperthyroidism With Radioactive Iodine

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THE USE OF radioactive iodine in the treatment of thyrotoxicosis in children is controversial. There is no categorical "best" form of therapy for a thyrotoxic patient. A choice among the various modes of therapy—anti-thyroid drugs, radioactive iodine, inert iodine or sub-total thyroidectomy—requires a knowledge of their advantages and disadvantages.[1] Radioactive iodine therapy appears to be emerging as the preferred form of treatment for the majority of patients over 40 years of age. A problem arises in the selection of therapy for patients less than 40.

There are possible hazards of genetic mutations and there have been recent reports on the occurrence of benign and malignant nodules following radioactive iodine therapy for diffuse toxic goiter in children.[11]

The following case report concerns a young girl who was found to have a thyroid carcinoma two years and three months after radioactive iodine therapy for a diffuse toxic thyroid gland. The possibility of coincidence will always exist whenever this relationship is reported. Until further reports are collected in the next ten to twenty years, no firm conclusions can be drawn. This case is reported to assist in arriving at those conclusions.

Submitted November 18, 1963.

Report of a Case

The patient, an 11-year-old white girl, was first admitted to Childrens Hospital, Los Angeles, on July 6, 1955. She had been referred by her family physician because of thyrotoxicity and a cardiac murmur.

She had been delivered two weeks "early" on February 227, 1943; her birth weight was 5 lbs. 1½ oz. She had measles at five years of age and a tonsillectomy at four years of age. At six months of age a cardiac murmur was first detected. She also had a hearing problem, which first started when she was six years old. There was some question of whether this was a complication of measles. She had no symptoms relative to the heart murmur.

The parents stated that she had had increased nervousness since six or seven years of age. Since the age of nine, she had been noted to have a fine tremor of the hands, slight exophthalmos, easy fatigability and difficulty in swallowing. It was at that time that the thyroid enlargement was first noted. She started menstruating at ten years of age. Cardiac films in the past suggested an enlarged right auricle, but in general there was a question of whether she had a "normal" or an enlarged heart. Her family physician started administering iodine therapy when she was nine years old, and it was continued to age 11 in variable doses and in variable courses of therapy. She had a basal metabolism determination three months before the present admission and the rate reported as a plus 15.

On physical examination, blood pressure 125/90 mm of mercury in the right arm and 125/80 in the left. The pulse rate ranged between 120 and 132. The skin was warm and moist. Proptosis was noted. The thyroid was diffusely enlarged—about three times normal size—without nodularity and without murmur or thrill. Note was made that perhaps the thrill or bruit could not be heard because it might have been abscured by a heart murmur which was present in the second left intercostal space. There was a continuous cardiac murmur, Grade 4, with systolic accentuation heard over the entire precordium. The heart was enlarged to the left, with the apex in the third interspace. With the patient asleep,

the pulse ranged between 95 and 110. She had a 40 per cent hearing loss in each ear.

Hemoglobin content was 14.3 grams per 100 ml of blood, leukocytes numbered 7,400 per cu mm. On July 8, 1955, the basal metabolic rate was minus 7.

The patient was discharged July, 1955. She had been receiving Lugol's solution until the first of July, 1955, and it was planned to place her on phenobarbitol and re-admit her in ten days for further evaluation.

When she was re-admited on July 19, 1955, her weight had gone from 121 pounds to 116 pounds. X-rays of the skull revealed no pituitary enlargement. The skull films were read as normal. After she had received no Lugol's solution for 20 days, the thyroid gland measured roughly 6 x 7 cm. It was soft and diffusely enlarged. The pulse rate was 142. On July 19 the metabolic rate was plus 34. Radioactive iodine uptake was 75 per cent and a scintigram showed no nodules to be present. On close examination no nodules were felt. Protein-bound iodine was 16.7 mcg per 100 ml (normal 4 to 8 mcg). On July 26, 1955, 1.25 millicurie of I^{131} was given by mouth. Administration of phenobarbital, 32 mg three times a day, was begun. Serum cholesterol content was 76 mg per 100 ml and bone age films showed an accelerated bony maturation compatible with a child 15 years of age.

An electroencephalogram was within normal limits. An electrocardiogram was interpreted as consistent with left axis deviation and some right ventricular hypertrophy.

When seen on August 17, 1955, the patient was calmer. The pulse rate was 130 and blood pressure was 115/50 mm of mercury. Loss of weight continued and when examined, on February 6, 1956, the patient had diarrhea, sweating, irregular and scanty menses and progression of exophthalmos. The pulse rate was 104.

On February 29, radioactive iodine uptake was 78 per cent and protein-bound iodine was 15.4 mcg per 100 ml. The patient was given 2.0 millicuries of I^{131} by mouth.

When the patient was examined in the endocrine clinic on May 23, 1956, the thyroid was still diffusely enlarged. The pulse rate was 80.

On March 12, 1957, cardiac catheterization was carried out. The question was raised of pulmonary valvular stenosis with moderate right ventricular hypertension and a right to left shunt, probably atrial. Examination at the endocrine clinic on April, 1957, showed the thyroid still diffusely enlarged without nodules.

On October 30, 1957, a nodule 3 x 4 cm was noted in the thyroid. This was two years and three months after the first treatment with radioactive iodine.

On November 9, 1957, the radioactive iodine uptake was 52.4 per cent and a scan showed decreased function in the left lobe of the thyroid gland, particularly in the nodule. The cholesterol content was 199 mg per 100 ml of blood, and her PBI was 9.4 mcg per 100 ml.

In December, 1957, administratin of prophylthiouracil was begun, 50 mg three times a day, and then Lugol's solution, 10 minims twice a day.

On January 10, 1958, subtotal thyroidectomy was performed. Several smaller nodules in the right and left lobes in addition to the prominent left lobe nodule were noted by the surgeon. The consistency of the gland and the vascularity were suggestive of hyperthyroidism.

The pathologist reported the prominent nodule to be about 3 cm in size and surrounded grossly by a whitish wall, firm, fibrous and approximately 2 mm thick. Microscopic examination (Figure 1) showed the submitted tissue to be made up of follicles of

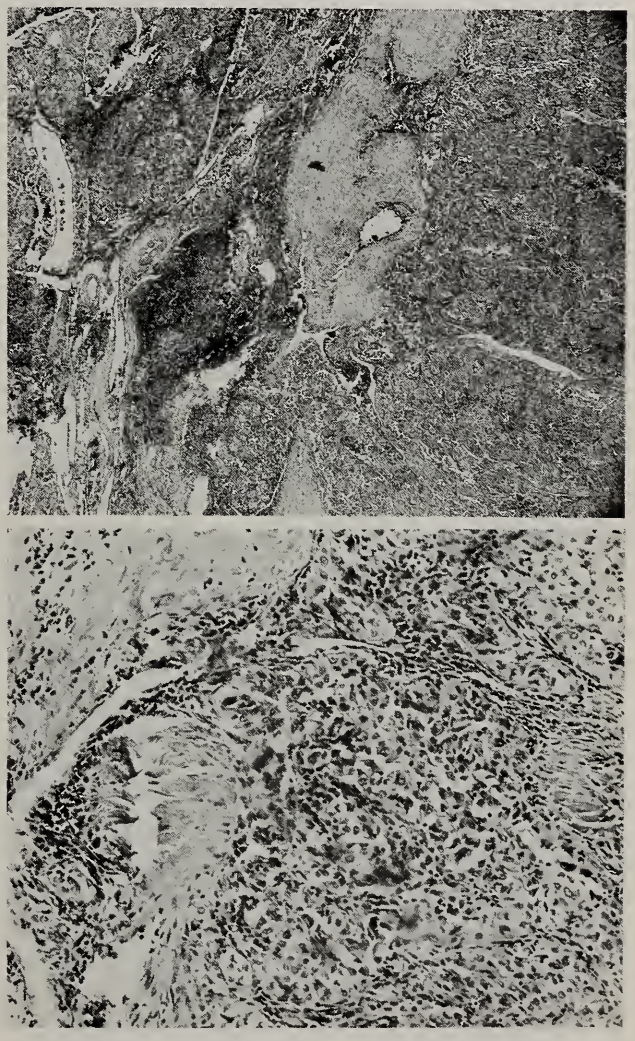


Figure 1.—*Upper,* papillary adenocarcinoma to the right infiltrating through the capsule. The tissue to the left shows extensive lymphocytic thyroiditis with hyperplasia of residual thyroid follicles (×40). Lower, high powered view shows a papillary adenocarcinoma with cells varying in size and configuration extending through the capsule (×160).

varying size, lined by flattened to cuboidal epithelium. The follicles contained a considerable amount of pink clumped colloid. Large masses of lymphoid tissue were frequent. Toward the center there was a 3 cm nodule surrounded by a capsule in most areas. The thyroid tissue surrounding this nodule was compressed. The nodule was made up of numerous irregular papillary structures having a papillary core and lined by one ot several layers of cells. These cells showed considerable variation in size and configuration. Mitotic activity was not evident. Chronic inflammatory cells were present. In many places, the cords or masses of tumor cells extended into or through the capsule and in places lay within the surrounding thyroid tissue. The cells tended to have nuclei displaced toward the periphery of the papillary structures. An adjacent submitted lymph node showed no evidence of metastatic tumor. The pathologists report was returned showing papillary carcinoma in the nodule, invading through capsule.

The patient thereafter was maintained on 0.12 gm of thyroid extract twice a day. When last examined, December 28, 1962, she showed no evidence of recurrent neoplastic disease and was asymptomatic with regard to the cardiac problem.

Discussion

Radioactive iodine was first prepared in 1934 and has been used in the treatment of hyperthyroidism since 1941. From 1946, I^{131} has been generally available as a pile-produced by-product. The rationale for its use is based on the fact that the thyroid gland naturally collects iodine. Once within the gland, the radioactive iodine emits high energy beta rays which penetrate only several millimeters into the thyroid tissue. Both gamma and beta rays are emited by I^{131}. The internal radiation thus administered is much more localized than that which could be delivered by external irradiation, with minimal damage to adjacent tissues.

In 1959[10] Sheline and coworkers reported a group of three cases (from 18 patients less than 20 years of age in which thyroid nodules developed five to 15 years after treatment of a diffuse toxic gland with I^{131}. One resected gland showed invasion through the capsule and the lesion was classified as an invasive adenoma or low grade carcinoma. It was the investigators' impression that nodules appeared to originate in hyperplastic regenerating areas of thyroid epithelium. This was thought in part to be due to the stimulating effect of thyrotropin activity on thyroid tissue which was still capable of proliferating despite injury and alternation by irradiation. The changes in the glands which had previously been treated with radioactive iodine showed perilobular and perifollicular fibrosis. There were chronic inflammatory cells in the parenchyma and follicular atrophy. The epithelial cells were pleomorphic. There were nuclear irregularity and hyperchromatism. All these changes showed effects in the thyroid gland similar to that seen with external irradiation therapy and in low grade thyroiditis.

There has been recent evidence[6-8] that thyroditis itself is associated with a higher incidence of carcinoma of the thyroid. In one series of 103 cases of Hashimoto's disease, nine patients had an associated thyroid carcinoma.

Both goitrogens and radioactive iodine have been implicated in the production of thyroid cancer in animals. There has been some experimental evidence, in animals, to show that there is a protective effect from the administration of thyroxin or from hypophysectomy in the prevention of thyroid tumors after radioactive iodine therapy.[4]

I^{131} releases 90 per cent of its energy in the thyroid gland and is largely excreted in the urine. In order to induce carcinogenesis experimentally, a low level of radiation must be maintained for a longer period of time. It is conjectured that the carcinogenic effect of I^{131} is likely to be negligible because it is so transient. One risk of carcinogenesis is directly related to the immaturity of the tissues in experimental work.

Another factor which precludes the routine administration of this drug to young patients is a lack of knowledge of the genetic mutations, which might affect the patients' offspring. One investigator stated that the total amount to the ovaries for an average therapeutic dose does not exceed that delivered by a diagnostic intestinal roentgen investigation or series of x-ray studies of the back. Ten millicuries of radioactive iodine delivers about 7r of whole body irradiation, and 2.02 re/millicurie of I^{131} is picked up by the ovaries and 2 rep/millicurie by the testes.[5,13]

In ovaries examined at autopsy the ovarian irradiation changes from therapeutic I^{131} were insufficient to induce mutations. Whether it will have a genetic effect or not is yet to be determined.

A significant number of cases of leukemia have now been reported following the use of radioactive iodine. The period of latency has ranged from three months to several years.

Although the above problems relative to tumor or genetic changes are the main points in the controversy as to whether or not to use radioactive iodine in young patients, there are other basic problems concerned in its use in this age group. These include reports of post-therapy hypothyroidism, the incidence ranging from 2.4 per cent to 24 per cent,[13] with a higher incidence in longer follow-up. There is difficulty in calculating a curative dose with the usual variations in response in children.[2]

In the present case, carcinoma of the thyroid was

observed two years and three months after treatment of thyrotoxicosis with radioactive iodine. There are numerous reports in the literature of youngsters who have received irradiation therapy in the head and neck and upper chest and have had a carcinoma of the thyroid three to twenty years later.[8,12]

The patient in the present case had numerous x-ray studies relative to a cardiac anomaly. It is possible that the previous x-ray studies of the chest played some small part in the development of the thyroid carcinoma.[7] The fact remains that she had a diffuse toxic goiter without clinical or scintigram evidence of nodules until after the radioactive iodine therapy.

Operation is still the treatment of choice in thyrotoxic patients under 20 years of age. It is effective, entails virtually no mortality, no genetic risks, no risk of carcinogenesis, and a very low incidence of postoperative hypothyroidism or technical complications.[3,14]

A definite conclusion cannot be drawn, but there is a suggestive correlation between the radioactive iodine therapy and the carcinoma. We feel that additional time must elapse before this potent agent can be considered safe for use in children.

Summary

A case of carcinoma of the thyroid in an 11-year-old white girl, detected two years and three months after radioactive iodine therapy of thyrotoxicosis, is presented. It may be that the neoplasm and the radioactive iodine therapy are related only by coincidence. The child also received considerable irradiation to the upper part of her chest to investigate her cardiac problem when she was young.

The authors believe that this case and others of a similar nature should be presented so that an evaluation of this possible complication can be made.

There is a definite lack of knowledge of the hazards implicit in the therapeutic use of radioactive iodine for benign disease in children.

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REFERENCES

1. Asper, Samuel P.: The treatment of hyperthyroidism, Arch. Int. Med., 106-6; 878-888, 1960.

2. Cassidy, C. E.; and Astwood, E. B.: Evaluation of radioactive I^{131} as treatment for hyperthyroidism, N.E.J.M., 261-2, 53-58, July, 1959.

3. Cattell, R. B.; and Morgan, E. S.: Recurrent hyperthyroidism—"A report of 306 cases operated upon from 1928 to 1937." Bull. of the N. Y. Acad. of Medicine; 68; 347-351, Feb. 15. 1939.

4. Maloff, F.: The effects of hypophysectomy and of thyroxine on the radiation induced changes in the rat thyroid, Endocrinology, 56 209-214, Feb., 1955.

5. Myant, N. B.: Therapeutic use in artificial radioisotopes: (Chapter 9—Treatment of Thyrotoxicosis by Radioiodine, p. 176) Edited, Hahn, Paul F.: Pub. 1956, John Wiley & Sons, Inc., New York City.

6. Pollock, W. F., and Sproug, D. H.: The rationale of thyroidectomy for Hashimoto's thyroiditis, 66:17-20, West. Jrn. Surg., 1958.

7. Raventos, A.; Horn, R. C., Jr.; and Ravdin, I. S.: Carcinoma of the thyroid in youth: A second look ten years later, J. Clin. Endoc. & Metab., 22-9; 886-891, Sept., 1962.

8. Saenger, E. L.; and Turner, M. E.: Neoplasia following therapeutic irradiation for benign condition in childhood, Radiology, 74; 889, June, 1960.

9. Schlicke, C. P.; Hill, J. E.; and Schultz, G. F.: Carcinoma in chronic thyroiditis, S.G.&O.; 3; 552-556, Nov., 1960.

10. Sheline, G. E.; Lindsay, S.; and Bell, H. Glen: The occurrence of thyroid nodules in children following I^{131} therapy for hyperthyroidism, J. Clin. Eno. & Metabolism, 19-1; 127-138, Jan. 1959.

11. Sheline, G. E.; Lindsay, S.; McCormack, K. R.; and Galante, M.: Thyroid nodules occurring late after treatment of thyrotoxicosis with radioiodine, J. Clin. Endo. and Metabolism, 22-1; 8-18, Jan., 1962.

12. Simpson, C. L.; Hempelmann, L. H.; and Fuller, L. M.: Neoplasia in children treated with X-rays in infancy for thymic enlargement, Radiology, 64; 840-845, June, 1955.

13. Volpe, Robert: Radioactive iodine in the treatment of hyperthyroidism: experience at Toronto General Hospital, 1950-1958: Canadian Med. Assn. J., 84; 84-87, Jan., 1961.

14. Werner, Sidney C.; Coelho, B.; and Quimby, E. H.: Ten year results of I^{131} therapy for hyperthyroidism, Bull. of the N. Y. Acad. of Medicine, 33:783-806, 1957.

Injury to Human Tissues from Sea Urchin Spines

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WITH THE increasing interest in SCUBA diving, many new medical problems have arisen, stemming from man's aggressive intrusion into the foreign environment of the sea. This report is concerned with injury and protracted disability resulting from contact with the purple sea urchin, *Strongylocentrotus purpuratus* (Stimpson), a common echinoderm inhabitant of the California coast, which ranges from Alaska to Mexico (Figure 1). There appears to be a paucity of published data regarding the effects of puncture wounds caused by the spines of this animal. Our interest in this subject was precipitated by the accident presented in the following case report.

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Figure 1.—Common Pacific Coast sea urchin *Strongylocentrotus purpuratus.*



Figure 2.—Fusiform swelling of chronic granulomatous reaction at site of puncture by sea urchin spine.

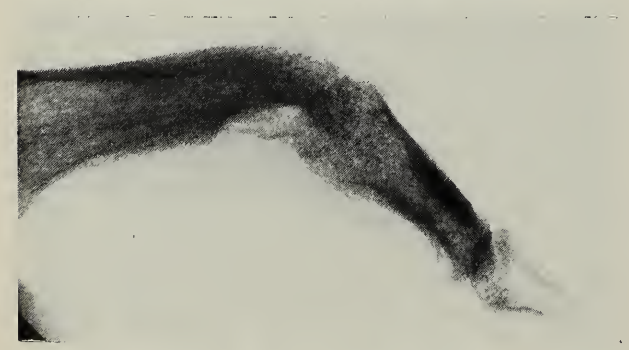


Figure 3.—X-ray film showing destruction of bone about injured joint at site of injury from sea urchin spine.

Report of a Case

A 30-year-old man was skin-diving for abalone along the Pacific Coast of California approximately 25 miles south of San Francisco in July of 1961, when he struck the back of his right hand against a sea urchin. The spines punctured the right middle finger in the region of the middle joint. The wounds which he noted at that time appeared to heal and he was symptom-free until October of 1961. He then noted the onset of swelling and discoloration in the region of the middle joint and these symptoms became progressively more severe. He was seen in January of 1962 by a physician who treated the process with administration of salicylates, local heat and a single hydrocortone injection in the finger, with uncertain relief.

When the patient was first seen by one of the authors on February 5, 1962 there was a fusiform swelling over the sides and dorsum of the middle joint of the right middle finger (Figure 2) and some bluish discoloration of the skin. The area was relatively painless to pressure and manipulation although motion in the joint was limited. X-ray studies showed no radiopaque foreign material in the tissues and no evidence of bone destruction.

On surgical incision, granulation tissue which had proliferated not only in the subcutaneous layer but also beneath the extensor tendon hood was observed. The synovial sheath of the joint appeared to be involved and partially disrupted. No grossly discernible fragments of sea urchin spine were identifiable, although there were streaks of chalky, pale discoloration in the granulation tissue which are believed to have represented a remaining reactive process where such fragments had been.

The pathological report on the removed tissue was as follows: "The specimen consisted of eight irregularly shaped masses of fibrotic, grayish-tan tissue, the largest measuring 27 x 8 x 4 mm. On one surface of the largest mass were small flakes of chalky-white material. Microscopically, the masses consisted of dense, collagenous fibrous tissue, extensively infiltrated with lymphocytes and histiocytes. Also present were small numbers of polymorphonuclear leukocytes and giant cells. In some areas the inflammatory cells formed small tubercle-like structures. No organisms were evident in hematoxylin and eosin stained sections. Schiff's stains and acid fast strains were prepared. No organisms were found. Diagnosis: Fibrous tissue showing a chronic granulomatous inflammatory reaction. In view of the history this is probably a foreign body reaction."

Following the removal of this granulation tissue, the tendon structure was repaired with absorbable sutures and the wound was closed. Postoperatively, some fluid reaction developed in the wound, but

this resolved without drainage. The fusiform swelling in the region of the joint remained essentially unchanged for four months following the operation. At that time the finger was put at rest in a plastic gutter-splint and held immobilized except for brief periods each day when it was removed for exercises to restore joint motion. When the patient was most recently seen, 12 months after operation, the swelling had diminished, the range of joint motion was increasing, and a small splinter of retained foreign body had extruded through the skin.

Postoperative x-ray films of the finger taken May 22, 1962 showed an osteolytic process in the distal portion of the proximal phalanx, associated with which there was evidence of joint narrowing typical of cartilage destruction (Figure 3). X-ray films taken August 3, 1962 showed this process to have been self-limited, and irregular bony deposition was in progress.

It would appear as if the most obvious factor which coincided with the turning point toward improvement in this case was the use of splint immobilization of the affected finger.

Discussion

Injuries from sea urchins may result from various causes, such as poisoning from ingestion of toxic ova, stings from venomous sea urchin pedicellariae, stings from venomous sea urchin spines, or mechanical trauma due to puncture wounds from nonpoisonous sea urchin spines. In the preceding case report, we were concerned with the last. There is no evidence that the spines of the purple sea urchin, *Strongylocentrotus purpuratus,* are toxic. They can cause, however, considerable trauma by inflicting severe puncture wounds with their calcific spines. If these wounds are improperly treated or neglected they can result in serious secondary infections.

In general, sea urchin spines are mounted on tubercles of the test, having an indented base that fits over a tubercle, thus forming a ball-and-socket joint. The shaft of the sea urchin spine, although appearing to be smooth in some species, is always ornamented and in some instances is quite rugose or thorny. Sea urchin spines are composed of calcium carbonate which occurs in the form of calcite intermingled with organic material. The surface of the spine is covered by a thin layer of epithelium. The calcareous substance has a fenestrated construction. The spines are usually difficult to remove with forceps and open surgical exposure is usually necessary.

Some of the tropical members of the echinoid families *Echinothuridae* and the *Diadematidae* possess long, slender, hollow, needle-sharp spines that are exceedingly dangerous to handle. The acute tips and the retrorse spinules permit easy entrance of the spines deep into the flesh and because of their extreme brittleness readily break off into the wound. Earle[1] (1941) described such problems in the South Pacific. The spines of some tropical sea urchin species serve as venom organs. Members of the genera *Areosoma* and *Asthenosoma* have the acute tip of the aboral secondary spines encased within a venom sac and stings from these animals can be extremely painful. Endean[2] (1961) described the effects of the neurotoxin from one species.

Injuries from most of our West Coast sea urchins are due to a combination of factors: (1) Foreign protein reaction caused by the epithelial covering of the spine; (2) foreign body reaction to the presence of retained fragments of broken spines; and/or (3) bacterial infection resulting from the puncture wound. Our observations would indicate that the foreign body reaction can become serious and chronic.

The case described by Rocha and Fraga[3] (1962) revealed that the foreign body reaction is an important aspect to be considered. They described firm, nonsuppurative cutaneous nodules on the dorsum of a diver's fingers; these nodules were painless except on pressure. Microscopically, the nodules showed a granulomatous reaction. Rocha and Fraga[3] reported that doubly refractile crystal fragments are demonstrable in some, but not all, specimens.

Men have always been in contact with urchins in the tidal zones and must have received a certain number of injuries. The absence of reports in the medical literature suggests that most of such cases have caused relatively little difficulty or disability. Oral reports indicate that along the Pacific Coast of Mexico it is the custom to treat urchin spines imbedded in the foot by fragmenting them by means of external percussion. The fragments are then left to be absorbed or encapsulated by the tissue. There are documented cases, of course, of the removal of spines surgically by open exploration, sometimes months after penetration. If encapsulated and not mechanically symptomatic, the calcite crystal could certainly be well tolerated indefinitely. Contrariwise, in the hand or foot where sensitivity and mechanical requirements are high, a chronic inflammatory process can be very disabling.

In the treatment of nonvenomous sea urchin puncture wounds, careful x-ray study of the affected part soon after injury would be most likely to disclose any flakes or fragments of the calcific spines. Ideally, such foreign material should be carefully removed by open surgical exploration. Blunt probing and grasping probably would only further fragment the pieces. Application of the principles of surgical debridement and cleansing of wounds, especially

adjacent to the important small joints of the hands, might well prevent retention of calcite or epidermal protein and thus avoid the serious sequelae of chronic inflammatory reaction. The use of antibiotics for control of bacterial infection should be gauged on the same general principles applicable to other types of wounds.

The problem of fusiform swelling of a finger, particularly about the middle or proximal interphalangeal joint, is a common one. Usually examination will show limited joint motion, and laxity or crepitation within the joint may be noted. There is usually some local redness and heat which goes along with the swelling. Early x-ray films are often not revealing but later will show joint narrowing and areas of decalcification on either side. In the presence of pain or instability, splinting of the affected joint generally gives prompt relief of symptoms and a chance for the lesion to abate if it is of a self-limiting nature.

Failure of favorable response under a reasonable trial of conservative therapy is an indication for surgical exploration and biopsy of the joint synovium or of bone if involved. A specific diagnosis may be made thereby, and specific treatment rendered. If the disease leaves the joint so disabled or painful as to be nonfunctioning, then surgical arthrodesis in approximately 45° of flexion can generally restore reasonably good use of the digit.

Summary

A case is described of a SCUBA diver with a chronic, disabling inflammatory reaction in his finger at the site of a puncture wound from a sea urchin spine. It is concluded that early treatment should consist of open surgical exploration and removal of spine fragments, to prevent, if possible, the development of a chronic granulomatous reaction and permanent disability.

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REFERENCES

1. Earle, K. V.: Echinoderm injuries in Nauru, Med. J. Australia; 2(10):265-266, 1941.

2. Endean, R.: The venomous sea urchin toxopneustres pileolus, Med. J. Australia, p. 320, March 4, 1961.

3. Rocha, G., and Fraga, S.: Sea urchin granuloma of skin, Arch. Derm., 85:406, 1962.

Tumor of the Duodenum Removed in the Course of Partial Gastrectomy For Duodenal Ulcer

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ZOLLINGER AND ELLISON were the first to relate the non-insulin producing islet-cell tumor of the pancreas to a peptic ulcer diathesis. These ulcers are often atypically located, are associated with large volumes of highly acid gastric juice and are refractory to the usual method of therapy. Since the publication of the original paper in 1955,[8] there has been considerable interest in the syndrome and additional cases have been added to the world literature. More than a hundred have been reported. Oberhelman and coworkers[5] in 1961 described six cases of ulcerogenic tumors of the duodenum which were considered to be misplaced, non-insulin secreting islet-cell tissue identical to the adenomas occuring within the confines of the pancreas, and they found that removal of the adenoma in the wall of the duodenum resulted in dramatic relief of the strong ulcerogenic tendency. Since his original report, Oberhelman has observed three additional cases and apparently Ellison has recently had his first.[4] Since the condition is so rarely encountered, a report of another patient with adenoma of the duodenum associated with duodenal ulcer seems indicated.

Submitted February 3, 1964.

Report of a Case

A 48-year-old Negro woman first started to have abdominal pain at the age of eight and by the time she was 13 she was having obstructive symptoms as well as pain. A roentgenological study showed a duodenal ulcer. Considerable improvement in symptoms was brought about by conservative treatment and she had no further major trouble until at age

16 she had an episode of fainting secondary to hemorrhage from the ulcer and was put in hospital for six weeks. Roentgenographic studies again showed evidence of a duodenal ulcer at the age of 28. Conservative therapy was carried out and healing was later demonstrated. "Ulcer pain" recurred from time to time, the patient taking antacid agents for relief. At the age of 33 she was admitted to a hospital with another episode of upper gastrointestinal bleeding and radiological studies showed pronounced deformity of duodenal bulb and a definite ulcer crater. Six weeks later the crater was no longer visible. During a month in hospital the patient received one blood transfusion as well as conservative treatment for ulcer. No gastric analysis was carried out at that time nor, as far as could be determined, at any previous time. Conservative management became less and less effective, the patient having a number of periods of symptoms of obstruction, and pyloric obstruction was demonstrated by roentgenogram. She was put in hospital several times because of this complication. Finally she had constant epigastric pain, only partly relieved by food and therapeutic agents. After a year of refractory symptoms, she elected surgical intervention. She gave no history of diarrhea at any time.

She was operated on in 1954 at the age of 39. Considerable scarring and narrowing was noted at the pylorus and in the first portion of the duodenum. There was sufficient normal duodenum beyond the scarred and ulcerated area to permit gastroduodenostomy, however, and the surgeon estimated that he removed three-fifths of the stomach. No note was made as to the condition of the pancreas; the liver was considered to be normal. The resected portion of the stomach measured 15 cm along the greater curvature. Microscopic examination of the distal portion of the specimen revealed gastritis of the antrum of the stomach, and the duodenum contained a chronic ulcer surrounded by considerable fibrosis. In an adjoining area, beneath a cluster of Brunner's glands, there was a well differentiated epithelial structure composed of interlacing double cords of cells with uniform oval nuclei and rather scanty cytoplasm devoid of granules. There were clusters of lymphocytes scattered through this lesion and it was considered at that time to be a hamartoma of the duodenal wall, probably of pancreatic origin. When the case was reviewed in detail in 1963, nine years later, the report of the duodenal hamartoma was noted and review of the slides revealed the lesion to be a pancreatic adenoma located in the duodenal wall (Figures 1, 2 and 3) and morphologically consistent with the ulcerogenic pancreatic adenoma as described by Zollinger and Ellison and others.

After the operation she had little "ulcer pain," and what pain she had responded readily to anti-

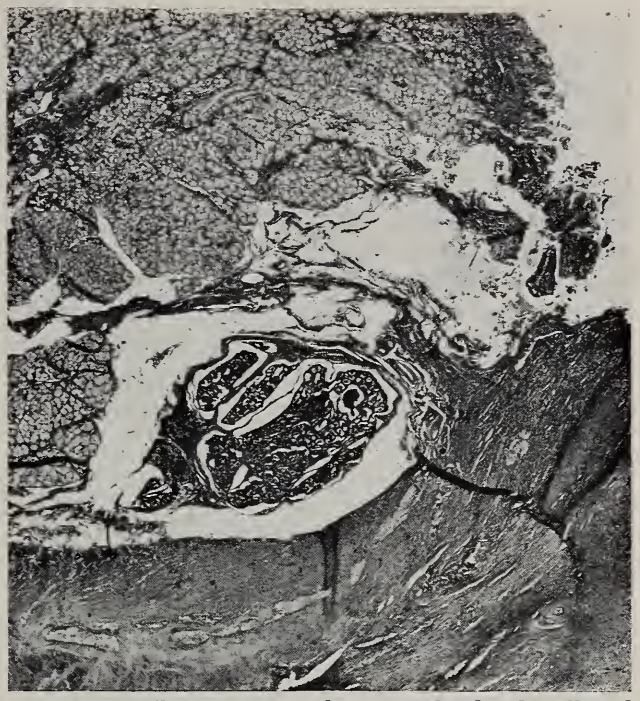


Figure 1.—Photomicrograph of the duodenal wall and the adenoma with the mucosa and the cluster of Brunner's glands above and the smooth muscle layers below. (Reduced from 16×.)



Figure 2.—Photomicrograph of the non-beta cell adenoma in the duodenal wall. (Reduced from 53×.)

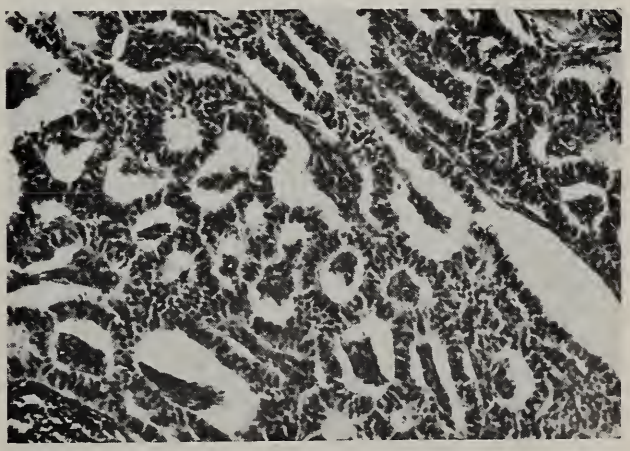


Figure 3.—Photomicrograph of the non-beta cell adenoma in duodenal wall. Lymphocytes in the left lower corner. (Reduced from 228×.)

acids and antispasmotics. A year after operation the patient had an episode of upper gastrointestinal bleeding requiring hospital admission and transfusions, and two years later, at the age of 42, she had a similar episode. Again at the age of 44 she was admitted with melena, weakness and fatigue. As the packed cell volume was 26 per cent four units of blood were administered. Roentgenologic studies revealed a gastric remnant which was considered to be rather large and a small ulcer just beyond the site of gastroduodenal anastomosis. Bleeding stopped spontaneously and the patient was discharged. Conservative management was continued and there were no further episodes of bleeding until 1963 when, at the age of 48, the patient again noted weakness and melena. She refused to enter the hospital and fortunately the bleeding stopped, but not until the hematocrit had dropped to 29. She did not receive a transfusion but the roentgenogram of the stomach after she had stopped bleeding again revealed a small ulcer of the duodenum just beyond the point of anastomosis. This ulcer was again noted after two months of diet and medication.

A gastric analysis revealed 16.6 mEq of free acid per liter and 15 mEq of total acid per liter in the fasting specimen; and following histamine stimulation (0.5 cc) the free acid rose to 47 mEq per liter with total acid of 60 mEq per liter. All specimens were free of bile. Three months later, in an effort to gain more knowledge of the secretory capacity of the stomach, a 12-hour, overnight gastric specimen which unfortunately contained some bile was collected. The total volume was 1,002 ml and it contained 13 mEq per liter of free acid (1.09 mEq per hour) and 30 mEq per liter of total acid (or 2.5 mEq per hour). This test was followed by a period of histamine stimulation (0.5 cc and although specimens again contained bile, the free acid was 31 mEq and the total acid 52.2 mEq per liter.

Atropine was then given and although all contained bile there was no free acid in any of three specimens, and the total acid was 14 mEq per liter. The serum potassium was 4.5 mEq per liter and the calcium was 4.5 mEq per liter. The fasting blood sugar was 93 mg per 100 ml, and the protein-bound iodine was 6.4 micrograms per 100 ml.

When last observed, the patient was following prescribed diet and medication and has had no further bleeding over a ten-month period.

The patients father had had ulcer symptoms for many years. He died as a result of an accident without having had any complication or operative treatment. Of her nine siblings, one brother had a duodenal ulcer which had bled a number of times. He had four operations for the ulcer and complications connected with the operations. He was, at last report, still having trouble. One sister had ulcer symptoms for many years and had massive bleeding on three occasions several years apart, care in hospital being required each time. She did not have surgical treatment.

Discussion

It is interesting that the existence of the adenoma in the wall of the first portion of the duodenum was not recognized by the operating surgeon nor was it described by the pathologist on his gross examination of the tissue removed. The exact size of this lesion was therefore never recorded, but it must have been very small. It was discovered in one of the microscopic sections of the duodenal wall, and a diagnosis of hamartoma of the duodenal wall, probably of pancreatic origin, was made. This was 18 months before the appearance of the original report by Zollinger and Ellison and seven years before Oberhelman's paper on ulcerogenic tumors of the duodenum, and the pathologist did not recognize it as an adenoma with a relation to the patients virulent peptic ulcer diathesis. Because further ulcerations developed after the operation, with four episodes of hemorrhage, a review of the microscopic sections was carried out, and the duodenal wall lesion was found to be consistent with an islet cell adenoma of the non-insulin secreting variety, considered by many investigators to be of alpha cell origin.[2]

One may speculate as to whether the patient had a functional ulcerogenic adenoma at the age of eight when she first started to have the upper abdominal symptoms that led to roentgenological diagnosis of an ulcer at the age of 13. It seems reasonable to assume that the ulcer diathesis in this patient, at least up to the time of operation, was based on the same physiological stimuli, and if that symptoms attributable to adenoma may have developed at an earlier age than in any other case thus far recorded. Davis and coworkers[1] reported the case of a boy, in whom symptoms started at the age of 15 years with a virulent form of ulcer diathesis, who eventually required total gastrectomy as the only satisfactory mode of therapy for a malignant non-beta cell neoplasm of the pancreas with metastatic tumor in the peripancreatic region.

The question does arise as to whether this lesion is malignant. There was nothing in the microscopic section to suggest malignant change in this case, and the subsequent course was not consistent with a malignant process. On the other hand, in three of the six cases reported by Oberhelman the lesions were malignant, as evidenced by local metastasis to lymph nodes. Oberhelman noted that the diagnosis of malignant change can not often be made by the histological appearance of the primary tumor; it is usually

made on the basis of metastasis to adjacent lymph nodes or to more distant sites. The incidence if malignancy in the ulcerogenic neoplasms in the pancreas itself is also approximately 50 per cent (Zollinger and coworkers[7]).

Jordan and coworkers[3] concluded from their own experience and that of others that the malignant lesions are not confined to the older age groups but are rather a disease of middle age with the greatest frequency in the fourth decade. The growth of the lesion, including metastatic implants, is slow and long survival is possible despite the presence of metastatic disease. Most but not all of the metastatic deposits function, and because of this the ulcer diathesis generally constitutes a greater risk to the patient than do the tumor and metastatic lesions. Total gastrectomy is indicated if there is evidence of unresected malignant deposits.

In the past ten years, the patient in the present case has had four major episodes of hemorrhage from a marginal ulcer in the duodenum which has been demonstrated by roentgenological studies. An understanding of the physiological mechanism behind her present tendency to form duodenal ulcers is of clinical importance. Is it a manifestation of additional adenomas either in the duodenal wall or in the pancreas, or of functioning metastatic lesions in the area, or does it represent the common form of marginal ulceration which relatively frequently follows subtotal gastrectomy of Billroth I type in patients with the usual form of peptic ulcer disease? These questions cannot be answered with any degree of certainty. It is known that ulcerogenic adenomas in the pancreas are often multiple, and presumably more than one can occur in the duodenal wall; indeed in one of Oberhelman's recent cases there were two duodenal adenomas.[4]

There are in the present case several reasons to doubt that the continued peptic ulcer activity was due to the presence of additional non-beta islet sell tumors of the duodenum or pancreas:

1. The ulcerogenic diathesis after the operation was perhaps not as severe as it might be expected to be if additional tumors were present.

2. Roentgenographic examinations reveal that there is a rather large gastric remnant still present. The recurrence rate in the case of the Billroth I procedure for duodenal ulcer without the addition of vagotomy is relatively high, especially if a high resection is not performed. Newton and Judd[6] in a recent follow-up study of 172 patients with gastric resection of Billroth I type found proved recurrent duodenal ulceration in 12.2 per cent of cases and suspected ulcerations in another 2.9 per cent; and recurrence was definitely more common in women. Thus small duodenal ulcerations that led to hemorrhage after the gastric operation in the present case may be simply owing to insufficient removal of the acid-secreting portion of the stomach. If this is so, adding vagotomy to the previous procedure might be sufficient to give her long-lasting protection from further trouble.

3. The studies on the gastric juice are suggestive that the continued trouble is not ascribable to retained ulcerogenic adenoma. Persons with an adenoma usually have a 12-hour nocturnal secretion of gastric juice exceeding 2 liters with a free acid content of 100 to 300 mEq, as compared with a normal volume in the range of 400 ml and an acid content of 18 mEq. A 12-hour nocturnal secretion of less than 100 mEq of hydrochloric acid may, however, be consistent with the diagnosis of an ulcerogenic tumor if the patient has had a previous gastric resection with or without a vagotomy, but many of these patients still produce large volumes of highly acid gastric juice. In the case reported here, the total volume was perhaps above average for a patient with a partial gastrectomy (1.002 ml) but the HCL output of 13 mEq during the 12-hour period is below what one might expect if an adenoma were still present. In addition, if an adenoma is present, often there is no definite response to histamine stimulation. (In the present case it was 10 mEq to 47 mEq per liter on one occasion; 13 mEq to 30 mEq per liter on another.) Also an inhibitory effect from atropine is not expected. (In the case here reported, no free acid was observed following atropine.) It would thus seem from all these observations that in the present case the patient's continuing difficulty may not be due to the presence of additional ulcerogenic adenomas but may represent the more ordinary form of marginal ulcer that can occur in any patient whose stomach continues to secrete moderate amounts of acid. The patient has been advised to have vagotomy but thus far has refused. If she is operated on at some time in the future, a very careful examination of the pancreas and the duodenum, preferably with the examining finger inserted into the lumen of the duodenum for more thorough bimanual palpation, should be performed. If no adenoma is found, vagotomy is probably the treatment of choice rather than the extensive procedure of total gastrectomy which is advised by many investigators when there is definite evidence of continued activity of one or more ulcerogenic tumors located in an area which can not be readily and completely removed.

Summary

A case is presented in which prolonged and severe ulcer diathesis was complicated by bleeding, obstruction and pain. Conservative treatment did not keep the disease in control. Incidental to partial gastrectomy with gastroduodenostomy an adenoma in the

wall of the first portion of the duodenum was removed. This lesion was morphologically consistent with the non-beta islet cell adenoma of the pancreas, the ulcerogenic tumor first described by Zollinger and Ellison. The patient had four episodes of hemorrhage from marginal ulcerations in the duodenum during a ten-year follow-up period after operation, but has had no further operation thus far.

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REFERENCES

1. Davis, C. E. Jr., Smith, P. Jr., and Davolas, X. S.: Ulcerogenic tumor of the pancreas, Ann. Surg., 155:669-680; 1962.

2. Greider, M. H., Elliott, D. W., and Zollinger, R. M.: An electron microscope study of islet cell adenoma, J.A.M.A., 186:120-123; 1963.

3. Jordan, G. L. Jr., Law, S. W., and Foster, R. P.: The management of patients with islet cell carcinoma exhibiting the Zollinger-Ellison syndrome, Amer. J. Surg., 105:80-86; 1963.

4. Oberhelman, H. A. Jr.: Personal communication to be published in Amer. J. Surg.

5. Oberhelman, H. A. Jr.; Nelson, T. S.; Johnson, A. N. Jr., and Dragstedt, L. R.: Ulcerogenic tumors of the duodenum, Ann. Surg., 153:214-227; 1961.

6. Newton, S. III, and Judd, E. S.: Long-term follow-up proves Billroth I gastric resection inadequate for permanent control of duodenal ulcer, S. G. & O., 116:170-174; 1963.

7. Zollinger, R. M., and Craig, T. V.: Ulcerogenic tumors of the pancreas, Am. J. Surg., 99:424-432; 1960.

8. Zollinger, R. M., and Ellison, E. H.: Primary peptic ulcerations of the jejunum associated with islet cell tumors of the pancreas, Ann. Surg., 142:709-723; 1955.

JUJUBE

A Cause of Perforated Bowel

GEORGE D. LAVERS, M.D., *Tulare*

JAMES E. FELDMAYER, M.D., *Exeter*

TO MOST PERSONS jujubes are a kind of hard gumdrops, with an unimpressive taste, that are bought for small money by small children. Some may have wondered casually about the origin of their musical name. In the present case, this curiosity was aroused and satisfied in a rather dramatic manner.

Report of a Case

The patient, a 57-year-old woman, a school teacher, was in excellent health except for mild hypertension, under good medical control, when the present episode started. She was teaching a class at school, when, at about 1 p.m., general abdominal cramping developed. As she knew that several of the other teachers had been bothered with diarrhea, she concluded that this was her trouble and in a few minutes excused herself, went to the bathroom and passed a soft stool. The cramps ceased for a time, but later in the afternoon recurred without any further stools, and by evening the cramping had turned into a rather colicky abdominal pain.

Submitted October 22, 1963.

The patient was examined and admitted to the hospital. A complete physical examination was in all respects uninformative. The abdomen was guarded during the attacks of colic but between the attacks was perfectly normal and painless to deep palpation.

Within the preceding year the patient had gastrointestinal and gallbladder x-ray examination that showed no abnormalities. The patient was observed in the hospital during the night and by morning the cramping attacks were more frequent and more severe and the patient was vomiting frequently. Results of urinalysis were within normal limits. Leukocytes numbered 20,000 per cu mm. X-ray films of the abdomen were taken and a consultant was called. The x-ray films showed laddering and fluid levels in the small bowel suggestive of obstruction. Physical examination was repeated and generalized abdominal guarding was noted, with definite rebound tenderness over most of the abdomen. The patient had no detectable hernia and there had been no previous abdominal operation. Fluids to make up the amount lost were administered intravenously and the abdomen was opened. The peritoneal cavity contained a considerable amount of thin, purulent material, with no odor, containing strands of fibrin and also particles of food. On further exploration a lesion was found at about the midpoint of the small bowel. Here a 5 cm segment of bowel was decidedly thickened and edematous, there was a tiny perforation at the mesenteric attachment. A hard foreign body could be felt within the lumen. It was approximately 3 cm in length and had sharp pointed ends. It was believed to be probably a swallowed bone. A 10 cm segment of bowel containing the foreign body, the inflamed area and the perfora-

tion was removed with a very small piece of mesentery. While anastomosis was being carried out, this unopened segment of bowel was examined roentgenographically but the palpable object was not visualized. The segment of bowel was then opened and the foreign body removed. It was obviously a pit from some kind of fruit, shaped like the pit of an olive but with very sharp points at each end. Clinging to the pit was a considerable amount of firmly attached pulp. The foreign body was shown to the patient's husband who immediately recognized it as a jujube pit.

The important part of the history then came out. The patient, who taught home economics, had been using this fruit in making a confection in the classroom. To do this, the fruit, also called "Chinese date," is soaked overnight in brine, cooked and bottled in syrup with spices. When it is eaten, the candied pulp is eaten from the pit and the pit is discarded. The patient had been eating some of this fruit but when queried later was unaware (presumably because she had complete dentures) that she had swallowed the pit. In this regard the patient volunteered that after acquiring dentures she stopped eating fish because of inability to detect the bones.

A jujube is described in Webster's New Collegiate Dictionary as follows: jujube (joo joob; 114), n. (F., fr. L. zizyphun, fr. Gr. zizyphon, fr. Per. zizafun.) 1. a. The edible drupaceous fruit of any of several trees (genus Zizyphus) of the buckthorn family. b. Any tree producing this fruit. Cv. Christ's-Thorn. 2. a. A jelly made from this fruit. b. A lozenge made of, or flavored with, this fruit.

Inquiry was made regarding the jujube at the Farm Advisors Office. There are about ten varieties of this plant grown in the warmer portions of California. It is not an important commercial fruit; most are used for ornamentation. The most common pronunciation for both the candy and the fruit, in this area, is "joo joobee," not "joo joob."

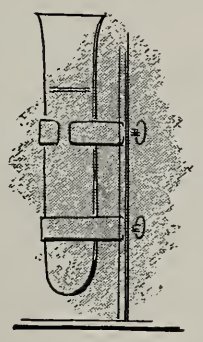


Photograph showing specimens of jujube fruit. At lower left the jujube pit removed at operation in the present case. The fruit is apple green, changing to saddle brown as it ripens.

Summary

A case of perforation of the small bowel due to the pointed pit of the jujube fruit has been described.

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California Medicine

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EDITORIAL

The Status of Influenza Vaccination 1964

DURING THE LAST two influenza seasons, many regions within the State of California felt the impact of epidemic influenza. In the winter of 1962-63, a widespread epidemic with severe morbidity and high mortality was observed over most of the nation. In California, however, the experience was limited to several outbreaks confined to institutionalized populations, although sporadic cases were noted in several communities. The effect upon industrial and school absenteeism was minimal. A slight rise in the number of pneumonia-influenza deaths was observed.

In mid-March and April of 1964, influenza A2 was again disseminated through much of the State, with more widespread effects than in the previous season. Community-wide outbreaks of influenza-like respiratory disease were reported, elementary school absenteeism was slightly increased, and the number of pneumonia-influenza deaths was 73 per cent above the expected level for the epidemic period.

Attempts to predict the occurrence of epidemic influenza are based on observations of the cyclic nature of this disease. It is assumed that this periodicity is in part determined by the balance of immunes and susceptibles in the population plus the factors responsible for genetic changes in the virus. In general, it has been observed that there is a tendency for influenza A to recur at two or three year intervals while B shows a cycle of approximately four to six years. The occurrence of A in California during both the 1962-63 and 1963-64 seasons was probably due to the relative mildness of the first outbreak. The last major outbreak of B was observed in 1961-62. For these reasons it is unlikely that a major epidemic of influenza will occur during the coming season. However, scattered, limited outbreaks are a possibility.

The Surgeon General's Advisory Committee on Immunization Practices and the California Department of Public Health concur in their recommendations for the administration of polyvalent influenza vaccines to high risk groups. These are outlined below. In general, it has been shown that influenza vaccine confers substantial protection against morbidity. It is assumed to be efficacious in reducing mortality among the aged.

Immunization is generally recommended for persons in groups where the mortality is high from epidemic influenza. These groups include those persons in all age groups who have chronic debilitating diseases such as: (1) patients with rheumatic heart disease — particularly those with mitral stenosis, (2) patients with chronic cardiovascular disorders such as cardiac insufficiency or arteriosclerotic heart disease and hypertension, (3) patients with chronic bronchopulmonary disease such as chronic asthma, chronic bronchitis, bronchiectasis, pulmonary fibrosis, pulmonary emphysema and pulmonary tuberculosis, (4) patients with diabetes mellitus and Addison's disease. The high risk group would also include persons in the older age groups. During three successive recent epidemics a moderate increase in mortality has been demonstrated among persons over 45 years of age and a pronounced increase among those over 65 years of age. It is noted that some increased mortality was observed among pregnant women during the 1957-58

influenza A2 epidemic both in this country and abroad. This has not been demonstrated in subsequent years.

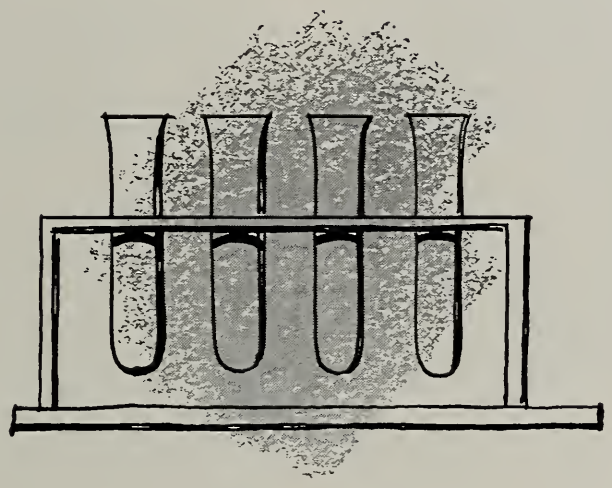
Vaccination should begin as soon as possible after September 1 and ideally should be completed by mid December. It is important that immunization be carried out before influenza occurs in the area.

Recent isolates of both the A and B strains demonstrate a continuing alteration in antigenic structure. Accordingly, more recent strains of both the influenza A2 and B strains have been added in increased amounts. The antigenic composition of the vaccine for the 1964-65 season is as follows:

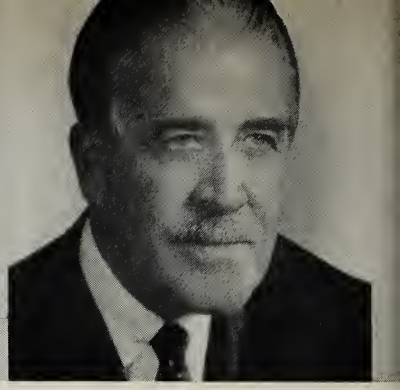
Type	*Strain*	*CCA Units per ml*
A	PR 8	100
A1	Ann Arbor 1/57	100
A2	Japan 170/62	200
B	Maryland 1/59	200

For primary immunization, two subcutaneous injections are given. The dosage schedule for adults is 1.0 ml (600 cca units) on two occasions about two months apart. For children 6-12 years of age the dose is 0.5 ml (300 cca units) on two occasions about two months apart. For the age group 3 months to 6 years, the dose is 0.1 to 0.2 ml (60-120 cca units) on two occasions separated by one to two weeks followed by a third dose of 0.1 to 0.2 ml about two months later. A yearly stimulating injection of polyvalent vaccine each fall is recommended for maximal protection. Since the vaccine viruses are produced in eggs, the vaccine should not be administered to persons who are hypersensitive to eggs or egg products.

This editorial was prepared at the request of the Committee on Scientific Information by Dr. L. S. Goerke, Dean, School of Public Health, University of California at Los Angeles, with the assistance of the California Department of Public Health.



The President's Page



Medicine and Religion

THERE HAS BEEN a growing acknowledgement in recent years that a patient's religious belief can play a vital role in his treatment and cure. As physicians, we naturally want to give each patient the most complete care possible. We want to treat the WHOLE man. I believe a new program the California Medical Association is developing in conjunction with the American Medical Association will help us do this more effectively in the future.

The AMA recently organized a Department of Medicine and Religion. Under its program, individual physicians and clergymen are being urged to get together at the local level for the benefit of the patient—to ensure that the whole man is provided for. Plans call for regular meetings aimed at strengthening a national program under which they can join forces.

The groundwork is being laid now in California to implement this program. There will be panel discussions involving physicians and ministers of all leading faiths in the various counties. Informal chats are planned where there can be discussion of common problems. You are going to hear a lot more about this program in months to come.

Why is such a program needed? Here, in my opinion, are some of the reasons:

Physicians are primarily concerned with the patient's physical condition, the clergy, with his spiritual welfare. And, although strong barriers separated science from religion in past centuries, today we are aware of the complex inter-relationships between man's body and his mind—or spirit, if you prefer. Today, we know that each can interact on the other—and that both must be treated.

I would like to quote a distinguished clergyman, Dr. Julian B. Feibelman, Rabbi of Temple Sinai in New Orleans, on this subject:

"The curtain between mind and spirit is thin, and often transparent. Who can distinguish between the sense of guilt, the domain of the psychiatrist, and the sense of sin, the minister's precinct? Do hopelessness and despair, loneliness and rejection, depression and obsession fall in the mental realm or the spiritual realm—or both? Sooner or later, they are malady or disease."

These are questions that many times challenge the physician *and* the clergyman. Our Medicine and Religion Program may well provide some answers, and some solutions to the problems they share.

I find it most heartening that in recent years great interest in the relationship of medicine and religion has been shown by the public information media—television, radio, newspapers and magazines and in seminars and forums attended by some of America's most respected medical and spiritual leaders.

Obviously, the two great fields of healing are growing closer. Perhaps only in science and the soul can twentieth-century man find refuge from the ultimate threat of nuclear extinction.

We who serve others should join forces. Medicine and religion must grow with reciprocal respect for each other and with deeper cooperation in meeting the tasks that confront us mutually.

James A. Doyle

California Medical Association

NOTICES AND REPORTS

Workmen's Compensation

Testimony by Carl E. Anderson, M.D.,
Chairman of the Council, California Medical Association,
Before the Workmen's Compensation Study
Commission, July 20, 1964, Los Angeles.

The data presented in this testimony are based on a study of physician attitudes regarding the California Workmen's Compensation System, conducted by the Bureau of Research and Planning in mid-1964. The full study, entitled *The California Workmen's Compensation System, Attitudes and Experiences of a Cross-Section of California Physicians*, was published in July by the California Medical Association simultaneously with Dr. Anderson's presentation and made available to the Workmen's Compensation Study Commission. Hence, the tables shown bear the numeric designations by which they are identified in the complete study.

The California Medical Association is pleased to have the opportunity of again presenting testimony and of recommending changes in the Workmen's Compensation law which, in our considered opinion, will tend to improve and expedite the medical treatment and rehabilitation of injured workmen, improve the relationships between the Industrial Accident Commission and physicians, and substantially reduce the spiraling costs and volume of litigation.

The Commission will recall that on March 26, 1964, at the time the California Medical Association first had the privilege of addressing itself to you, it was recommended that you consider the advisability of effectively separating, in the jurisdiction of the Industrial Accident Commission, the medical and rehabilitative functions from those activities of the Commission which relate to the determination of liability and compensation to the injured workmen.

In order to achieve this separation of the medical from other functions, it was recommended that there be established a medical administrative division or department within the Commission. This division would be headed up by a Medical Administrator who would be responsible to the Industrial Accident Commission for the supervision of all aspects of the Workmen's Compensation law relating to medical care, rehabilitative services, determination of disability, the establishment of fees paid to physicians, and would determine or certify to the medical facts in each litigated case. Such findings of medical fact would be binding upon the Referees and the Commission in the absence of substantial evidence to the contrary.

The Medical Administrator would be guided in his activities by a broadly-based Medical Advisory Committee which would meet with him at regular intervals.

The Medical Advisory Committee would deter-

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mine medical and rehabilitative policy in its broadest sense, with its primary responsibilities directed toward the:

1. Prompt and efficient medical and vocational rehabilitation of the injured workman.

2. Conservation of the medical care dollar through the avoidance of delays, overutilization, and other abuses.

3. Reduction of litigation based upon disagreement as to the medical facts, using the mechanism of medically designated, promptly utilized, and adequately compensated, impartial Medical Examiners and expert medical panels.

It continues to be our belief that a medical administrative division, set up along the general outline just described, would be of significant benefit to all parties involved in the handling of workmen's compensation cases.

The California Medical Association is well aware of the excellent work the present and previous medical directors of the Commission have performed over the past many years. The present recommendations envision a much broader and more extensive scope of activity and responsibility than that now undertaken by the Commission's medical department.

The Study Commission will also recall that, with the cooperation of your staff, the California Medical Association conducted a questionnaire survey of a broadly representative sample of the physicians of California in order to gain insight into their experiences, attitudes, and criticisms relating to the Workmen's Compensation law and its administration. We are pleased at this time to present to you the results of that questionnaire survey.

The questionnaire was mailed to 3,944 practicing physicians and surgeons in California. This represents an approximate 20 per cent sample of all practicing physicians.

Sixty-four per cent of the sample, or 2,522 physicians replied, and their replies have been tabulated and analyzed.

The questionnaire was designed to reflect physician opinion and experience in the following broad areas:

1. The relative frequency with which physicians in general practice and the specialties have occasion to treat compensation cases.

2. The method of choice of physician, and what effect it might have on the injured workman's medical care.

3. The physician's ability to carry out necessary physical rehabilitation, and the adequacy of rehabilitation facilities.

4. The adequacy of fees paid for medical services under the present system.

5. An open-end question permitting the physician

TABLE 1.—*Specialty Designation of Physicians Providing Care to Workmen's Compensation Patients, By Frequency of Treatment*

	Frequency Treating WC Patients								
	Often		*Sometimes*		*Rarely*		*Never*		*Total*
*Specialty**	*Number*	*Per Cent*	*Number*	*Per Cent*	*Number*	*Per Cent*	*Number*	*Per Cent*	*Number*
Occupational Medicine	29	96.7	0	—	0	—	1	3.3	30
Orthopedic Surgery	238	85.9	33	11.9	2	0.7	4	1.4	277
Neurosurgery	15	68.2	6	27.3	0	—	1	4.5	22
Physical Medicine	4	57.1	2	28.6	1	14.3	0	—	7
Ophthalmology	62	53.0	40	34.2	10	8.5	5	4.3	117
General Practice	289	48.4	231	38.7	56	9.4	21	3.5	597
All Part-Time Specialties	153	42.0	139	38.2	57	15.7	15	4.1	364
General Surgery	96	37.9	109	43.1	37	14.6	11	4.3	253
Dermatology	15	28.8	20	38.5	12	23.1	5	9.6	52
Plastic Surgery	5	26.3	10	52.6	1	5.3	3	15.8	19
All Other Specialties†	8	14.0	12	21.1	22	38.6	15	26.3	57
Internal Medicine	20	5.5	93	25.8	182	50.4	66	18.3	361
Urology	1	1.6	21	32.8	36	56.3	6	9.4	64
Obstetrics–Gynecology	7	3.7	11	5.8	43	22.6	129	67.9	190
Psychiatry	2	1.8	8	7.2	25	22.5	76	68.5	111
Total	944	37.4	735	25.2	484	19.2	358	14.2	2,521‡

*Specialties exclude part-time specialists, unless otherwise indicated. Survey excluded several full-time specialties—professional services of which are not applicable to study.

†Includes Allergy, Cardiovascular, Gastroenterology, Neurology, Preventive Medicine, Colon and Rectal Surgery, Pulmonary Diseases and Thoracic Surgery.

‡Total may vary slightly among this and subsequent tables due to coding inconsistencies. In no case are the percentages affected appreciably.

to identify major existing problems and areas of grievance, and to suggest appropriate solutions.

Due to the length and detail of the report, I shall only touch upon some of the highlights of the study and, with your permission, use charts for reference as I summarize the information which is pertinent to your inquiry.

Table 1 indicates the major fields of practice of physicians who treat workmen's compensation cases. The upper 10 fields of practice in the table are involved either often or sometimes in over 70 per cent of the responses. If all physicians who treat "often" or "sometimes" are included, we find that almost 63 per cent of the respondents are involved to this degree. The responses further indicate that almost 86 per cent of California physicians see workmen's compensation cases at one time or another. Thus, the laws and practices of the workmen's compensation system are of great and almost universal concern to the doctors of the entire state.

Table 2a relates to the question of which physicians should treat industrial accident patients, and how they should be selected. The data reveal that the majority (52 per cent) of physicians prefer the method whereby *all physicians willing and able to provide the essential services* be given the opportunity to treat the injured worker. The system of free choice of physician is reinforced by another 20 per cent of the physicians who favor the establishment of medical society registers of all physicians interested in participating in the program. Thus, at least 70 per cent of all respondents favor the initial selection of physician by the patient.

While I am on this subject, I should like to digress for a moment on a matter which has some pertinence to this and other portions of our presentation. Our attention has been called to the fact that members of the Commission are planning on-site studies of

TABLE 2a.—*Respondent Preference as to Basis for Physician Participation Under Workmen's Compensation (Numbers and Per Cents By Frequency of Treatment)*

Frequency of Treatment By Respondent Under Workmen's Compensation	*Preferred Basis of Participation*								
	Employer or Insurance Carrier Selection		*All Physicians Willing and Able*		*Med. Society Registers of Interested Physicians*		*No Preference (No Answer)*		*Total Number*
	Number	*Per Cent*	*Number*	*Per Cent*	*Number*	*Per Cent*	*Number*	*Per Cent*	
Often	297	31.5	505	53.5	134	14.2	17	1.8	944
Sometimes	120	16.3	444	60.4	157	21.3	22	3.0	735
Rarely	71	14.7	262	54.0	127	26.3	27	5.6	483
Never	23	6.7	92	26.7	95	27.6	134	39.0	344
Total	511	20.4	1,303	52.0	513	20.4	200	8.0	2,506

NOTE: A total of 21 respondents (out of 2,506 usable responses to this question) checked more than one preference. These responses are enumerated under *both* preferences noted, hence numbers and per cents will add to more than totals shown.

TABLE 2b.—*Respondent Preference as to Basis for Physician Participation Under Workmen's Compensation (Numbers and Per Cents by Geographic Areas)*

Area	*Preferred Basis of Participation*								
	Employer or Insurance Carrier Selection		*All Physicians Willing and Able*		*Med. Society Registers of Interested Physicians*		*No Preference (No Answer)*		*Total Number*
	Number	*Per Cent*	*Number*	*Per Cent*	*Number*	*Per Cent*	*Number*	*Per Cent*	
S.F.–Oakland Metropolitan	96	19.6	240	49.1	100	20.4	54	11.0	489
L.A.–Long Beach Metropolitan	212	19.3	564	51.3	251	22.8	92	8.4	1,108
San Diego Metropolitan	21	14.2	86	58.1	34	23.0	10	6.8	148
San Bernardino–Riverside Metropolitan	28	26.2	59	55.1	14	13.1	6	5.6	107
Other Metropolitan Areas*	89	24.5	188	51.8	58	16.0	30	8.3	363
Non-Metropolitan Areas	65	22.3	166	57.0	56	19.2	8	2.7	291
Total	511	20.4	1,303	52.0	513	20.4	200	8.0	2,506

*Includes Fresno, Bakersfield, Sacramento, Stockton, Santa Barbara, and San Jose Metropolitan Areas.
NOTE: See note on Table 2a.

TABLE 3a.—*If You Have Treated Such (Workmen's Compensation) Patients, Do You Believe That for* MOST *Types of Workmen's Compensation Cases Which You See, You Are Capable of Giving Adequate Physical Rehabilitation?*

Specialty*	Yes		No		No Answer		Total Number
	Number	Per Cent	Number	Per Cent	Number	Per Cent	
Cardiovascular	9	47.0	5	29.4	3	17.6	17
Dermatology	34	69.4	6	12.2	9	18.4	49
General Practice	467	81.3	76	13.2	32	5.6	575
General Surgery	258	72.9	48	13.6	48	13.6	354
Internal Medicine	201	57.7	107	30.7	40	11.5	348
Neurosurgery	6	28.6	7	33.3	8	38.1	21
Obstetrics–Gynecology	70	60.9	25	21.7	20	17.4	115
Occupational Medicine	32	78.1	9	21.9	0	—	41
Ophthalmology	86	76.1	10	8.8	17	15.1	113
Orthopedics	227	80.8	24	8.5	30	10.7	281
Physical Medicine	15	93.8	0	—	1	6.2	16
Plastic Surgery	11	68.8	1	6.2	4	25.0	16
Psychiatry	16	34.7	24	52.1	6	13.1	46
Urology	38	62.3	10	16.4	13	21.3	61
All Others†	82	76.6	17	15.9	8	7.5	107
Total	1,552	71.9	369	17.1	239	11.1	2,160

*Includes part-time specialties.
†See footnote 2, Table 6a.

several industrial programs. Such studies are obviously desirable. However, these well organized programs in the automobile industry represent less than ½ of one per cent of the employed population in California, and only a small percentage of all establishments in which employed persons are found. The majority of workmen's compensation patients come from establishments which are small in size, and from industries which will not be involved in your proposed site visits. It is estimated that over 50 per cent of employed persons in California work for establishments employing under 100 persons. More than two-thirds work in establishments employing under 250 persons. Many of the most serious problems of workmen's compensation arise on the farm, in the forests, and in the construction industry. Recognition should be given to the fact that there is a statewide problem; many important aspects of treatment and rehabilitation exist outside the large, well-organized, industrial plants. We would therefore hope that the Commission would include in its on-site study examples of various types and character of employment, particularly those types in which severe industrial accidents are known to occur with considerable frequency. As I indicated previously, such a more representative study would focus

TABLE 5a.—*Do You Feel That the Fees You Receive for Workmen's Compensation Cases Are Adequate in Relation to Your Usual Fees? (All Physicians Who Treat Workmen's Compensation Cases, Regardless of Frequency, by Medical Specialty)*

Specialty*	Opinion Concerning Fees						Total Treating
	Adequate		Inadequate		No Opinion		
	Number	Per Cent	Number	Per Cent	Number	Per Cent	
Cardiovascular	4	25.0	11	68.8	1	6.2	16
Dermatology	23	46.9	24	48.9	2	4.1	49
General Practice	182	31.7	378	65.7	15	2.6	575
General Surgery	54	15.2	287	80.8	14	3.9	355
Internal Medicine	55	15.9	267	77.4	23	6.7	345
Neurosurgery	1	4.8	20	95.2	0	—	21
Obstetrics–Gynecology	39	34.2	57	50.0	18	15.8	114
Occupational Medicine	17	41.5	24	58.5	0	—	41
Ophthalmology	25	22.1	85	75.2	3	2.7	113
Orthopedic Surgery	28	10.0	251	89.3	2	0.7	281
Physical Medicine	8	50.0	8	50.0	0	—	16
Plastic Surgery	1	6.2	13	81.3	2	12.5	16
Psychiatry	23	50.0	13	28.3	10	21.7	46
Urology	19	31.7	31	51.6	10	16.7	60
All Other†	25	23.6	75	70.7	6	5.7	106
Total	504	23.4	1,544	71.7	106	4.9	2,154

*Specialists include both full-time and part-time.
†See footnote 2, Table 3a.

attention on the need for free choice of physician and provide greater insight into other problems which require attention if the workmen's compensation system in California is to be improved. It would be hoped that such visits could be completed within the previously announced time-table of the Study Commission.

Table 2b shows physician preference as to the method of physician participation. Based upon responses from major metropolitan areas, the data reveal that there are no significant differences in the method preferred—that *all physicians willing and able to provide the essential services* should be permitted to do so.

I am taking Table 6a out of order since the question is directly related to the method of physician participation in the workmen's compensation system. This question asked each physician to indicate what level of care he believes patients would receive if they had free choice of physician. The overwhelming majority—almost 82 per cent—replied that injured workers would receive the same level or better care than they were now receiving. Although there is a divergence of opinion by those physicians who devote over 20 per cent of their time to industrial patient care, only 10 per cent of all physicians felt that free choice would result in "not as good" care. Our study also reveals that the major reason physicians gave for their opinion was that free choice of physician would result in a better physician-patient relationship; 65 per cent of the respondents to the study who believe patients would receive better care so indicated.

We recognize, of course, that for a variety of reasons it may be desirable on occasion to transfer patients from one physician to another. With very few exceptions, such a decision should be based upon medical opinion and judgment. This transfer should be made in consultation with the treating physician. Wherever the insurance carrier's medical consultant and the treating physician could not agree on such a transfer under a free choice system, the medical administrator could then step into the picture, based upon the guidelines and procedures established by the Medical Advisory Committee under the proposal we previously submitted.

It should also be noted that initial choice of physician is a recommendation of several other major organizations which have studied the problem. This system is in effect in somewhat less than one-third of the states. In New York State, for example, the system has worked to the reported satisfaction of both the insurance carriers and the medical profession. Wisconsin, Hawaii, North Dakota, and Oregon are other examples. The time is long overdue for California to provide the injured worker with the same privileges he enjoys as when he seeks care for non-occupational reasons. The situation which gave rise to limited or no choice no longer prevails, and its existence can no longer be justified.

Turning now to the subject of physical rehabilitation, Table 3a reflects the responses to the question, "If you have treated such [workmen's compensation] patients, do you believe that for *most* types of workmen's compensation cases which you see, you are capable of giving adequate physical rehabilitation?" The overwhelming response—72 per cent—stated that they did. Most physicians consider that physical rehabilitation means the restoration of maximal function of the injured part of the body or of the injured worker. In this context, the reply to this question means that the physician respondents indicate their belief that, in the usual course of their treatment, they are capable of bringing about the maximal restoration of function in the patients under their care.

Obviously, the physician who is a dermatologist is not concerned with the man with a broken hip, nor does he treat such a case. It can also be inferred from the responses of the neurosurgeons that they need, and undoubtedly utilize, additional professional assistance in the nature of physiatrists and rehabilitation centers for a large number of their patients. There is a relatively small number of severely injured and permanently disabled patients who require extensive rehabilitation—not only physical, but also psychological, social, and vocational coordinated programs. In this regard, the Commission is urged to consider various mechanisms to remove the present barriers faced by the individual who may require extensive vocational rehabilitation services. Recognizing that such an individual will require the necessary income maintenance, and that unusual cases may require the expenditure of large sums of money by the carrier, it is proposed that there be established a pooled fund among carriers which can be maintained by the allocation of a small percentage of premiums charged to each employer. Here, again, collective judgment can be exercised with the advice of the Medical Administrator and Medical Advisory Board to select these cases for which the pooled fund would be used.

Another question in our study, but not covered by this chart, asked physicians if they were capable of supervising physical rehabilitation for most types of workmen's compensation cases which they see. Somewhat over 65 per cent of the respondents said they were. The reasons for so doing are related to those which I gave in answer to the previous questions, and to the definition of restoration as applied to each physician's specialty.

Table 7 shows the responses regarding physician opinion as to the adequacy of physical rehabilitation facilities in their communities. The overwhelming

TABLE 6a.—*What Level of Care Do Physicians Think Patients Would Receive If They Had Free Choice of Physicians, Relative to the Level Received Under Present System: All Respondents By Medical Specialties*

Specialty*	Level of Care: Same Level Number	Same Level Per Cent	Better Care Number	Better Care Per Cent	Not As Good Number	Not As Good Per Cent	No Answer Number	No Answer Per Cent	Total Response
Cardiovascular	4	20.0	13	65.0	3	15.0	0	—	20
Dermatology	15	27.8	26	48.1	9	16.7	4	7.4	54
General Practice	251	42.2	296	49.7	36	6.1	12	2.0	595
General Surgery	143	39.3	164	45.1	49	13.5	8	2.2	364
Internal Medicine	133	31.9	204	48.9	44	10.6	36	8.6	417
Neurosurgery									
Obstetrics–Gynecology	8	36.4	9	40.9	4	18.2	1	4.5	22
Occupational Medicine	63	25.6	137	55.7	16	6.5	30	12.2	246
Ophthalmology	10	23.8	6	14.3	25	59.5	1	2.4	42
Orthopedic Surgery	67	56.8	32	27.1	15	12.7	4	3.4	118
Physical Medicine	89	31.6	108	38.3	82	29.1	3	1.1	282
Plastic Surgery	5	31.2	7	43.8	3	18.8	1	6.2	16
Psychiatry	6	31.6	3	15.8	7	36.8	3	15.8	19
Urology	47	38.5	43	35.2	11	9.0	21	17.2	122
All Other†	27	40.9	30	45.5	5	7.6	4	6.1	66
Total	48	37.8	58	45.7	13	10.2	8	6.3	127
	916	36.5	1,136	45.3	322	12.8	136	5.4	2,510

*Includes part-time specialties.

†Includes Allergy, Aviation Medicine, Colon and Rectal Surgery, Preventive Medicine, Gastroenterology, Neurology, Pulmonary Diseases, Thoracic Surgery and GP's with part-time specialties other than those individually listed in the table.

response of almost 92 per cent of the respondents who believe they are adequate can be interpreted as a reflection of physician awareness of the existence of major rehabilitation centers as well as coordinated programs in the major medical communities. Understandably, such facilities have been slower in developing in non-metropolitan areas. However, even the 84 per cent of the physicians from these areas indicate a very satisfactory level which will undoubtedly improve with population growth and the continuing dispersion of medical specialists throughout the state. The California Medical Association believes that most physicians are aware of the existence of rehabilitation centers. Nevertheless, in order to improve this awareness and utilization, we are embarking on an educational program to make *all* physicians aware of their existence and the range of services they provide.

The next portion of the survey relates to the medical fee schedule. Table 5a indicates the responses of physicians to the question, "Do you feel that the fees you receive for workmen's compensation cases are adequate, in relation to your usual fees?" This table, and three others in our full report, reveal the overwhelming dissatisfaction with fees—with 75 per cent of all respondents declaring them inadequate. The data are significantly consistent, whether physicians treat "often" or "sometimes."

Historically, there has been in existence a *minimum* fee schedule for professional services under workmen's compensation. The majority of carriers have, unfortunately, interpreted and applied the minimum schedule as a maximum and *only* schedule. At no time in its history has this schedule reflected the usual and customary charges made by physicians for these same services to the public at large.

TABLE 7.—*Rehabilitation Facilities: Opinion of Respondents as to Their Adequacy, By Metropolitan Area*

Metropolitan Area	Adequate Number	Adequate Per Cent	Inadequate Number	Inadequate Per Cent	Total Response
San Francisco–Oakland	371	94.4	22	5.6	393
Los Angeles–Long Beach	872	93.3	63	6.7	935
San Diego	120	93.8	8	6.2	128
San Bernardino–Riverside	90	90.0	10	10.0	100
Other Metropolitan*	297	91.1	29	8.9	326
Non-Metropolitan	236	84.3	44	15.7	280
Total	1,986	91.8	176	8.1	2,162

*Includes Fresno, Bakersfield, Sacramento, Stockton, Santa Barbara, and San Jose Metropolitan Areas.

The format of the schedule has remained virtually unchanged for 40 years, and has not adequately reflected the changing pattern and character of medical practice. The individual fees within the schedule do not bear reasonable relationships, in many instances, to other fees within the same schedule. The scheduled allowances for some of the more frequent services, such as the initial visit, are grossly inadequate. The level of fees is such that many physicians refuse to participate in the care of the industrially injured except, of course, in the case of an acute emergency. Many physicians participate with reluctance out of allegiance to their patients. It is our recommendation that any schedule of fees for medical services under Workmen's Compensation laws should be at a level comparable to the charges customarily made to the public at large for similar services. We also urge that any such schedule accurately reflect medical practice as represented by current Relative Value Studies published by the California Medical Association. A further recommendation is that the division of medical administration within the Industrial Accident Commission which we have recommended should guide the Commission in the establishment of an appropriate level of fees, and arbitrate any disputes regarding charges for professional services.

We have been informed from time to time by responsible representatives of the workmen's compensation insurance carriers that medical fees account for approximately 12 per cent of the total cost of their workmen's compensation insurance program. Therefore, an increase in medical fee allowances up to the usual and customary level could, at most, increase overall costs by only a few percentage points. Furthermore, the adoption of a realistic schedule to reflect usual and customary fees would aid in the elimination of some abuses which are the result of an inadequate fee schedule and thereby lessen the actual necessary increase in premiums. It would also encourage more physicians to participate in the treatment and rehabilitation of these patients, thus broadening and improving the medical care available to the injured worker.

We have conducted other studies which indicate that the average charges made for physicians' services are rising at a rate of about 4 per cent a year in California. Some consideration should be given to this factor in the development of a schedule of allowances.

The last area of inquiry concerns itself with specific complaints and recommendations for their solution. Table 8 contains some of the data from the more detailed table in the full report. The information is based upon the question in which we asked respondents to identify from their own experience problems in workmen's compensation, and their suggested solutions to them. The most frequently cited problems were those of inadequate fees, the large amount of paper work, and time expended in the completion of claim forms. Suggested solutions to these problems are: That fees be increased, that the Relative Value Studies be the format for fee unit value determination for professional services, and that physicians be paid their usual fees. The majority of physicians citing the problem of excessive and time-consuming paper work suggested that shortened or simplified claim forms be utilized to resolve this problem. This subject has been under discussion by the Committee on Occupational Health of the California Medical Association for some time. It is our belief that the initial and subsequent report forms can be so designed as to be more compatible with the established methods of medical practice—serving as a summary of the history and physical findings, and of the diagnosis.

TABLE 8 (Partial).—*Frequency with Which Respondents Mention Specific Problems in Workmen's Compensation: Type of Problem Mentioned By Whether or Not Respondent Treats Workmen's Compensation Cases*

	Total Respondents: 2,522			
	Mentions Problem		*Does Not Mention Problem*	
Problem	*Number*	*Per Cent*	*Number*	*Per Cent*
Fees	1,663	65.9	859	34.1
Forms and paper work	467	18.5	2,055	81.5
Choice of physician	1,220	48.4	1,302	51.6
Non-medical persons making medical decisions	194	7.7	2,328	92.3
Other insurance carrier-caused annoyances	174	6.9	2,348	93.1
Employer-caused annoyances	168	6.7	2,354	93.3
Delays	167	6.6	2,355	93.4
Abuses by physicians	226	9.0	2,296	91.0
Annoyance re: system of surgical authorization	19	0.8	2,503	99.2
Annoyances caused by IAC	71	2.8	2,451	97.2
Abuses by patients	115	4.6	2,407	95.4
Problems caused by "The System"	73	2.9	2,449	97.1
Total respondents noting any problem	2,081			
Average number of problems cited by each respondent	1.8			

while also serving as a source of statistical information for the Division of Labor Statistics and Research. This matter, again, should fall within the purview of the proposed Medical Advisory Committee.

The detailed report also contains an enumeration of other grievances, criticisms, and dissatisfactions which will be of interest to your Commission, and which may be helpful to you in your total evaluation.

In conclusion, I am pleased to inform the members of the Study Commission that the California Medical Association is impressed by the interest and broad perspective of your study. We are gratified with the opportunity to present our views and recommendations, which we believe accurately represent those of the physicians in California. Our interest in your study is to promote the continued improvement and extension of medical care and rehabilitation of the injured worker in California. Our goal is the maximal restoration of the occupationally disabled person. The vast majority of physicians endorse and attempt to fulfill this goal. For our part, as the professional association composed of most practicing physicians in California, we shall continue to pursue this responsibility. If we are to attain this objective, we shall need the support of constructive alterations in the administration of the workmen's compensation system.

In Memoriam

Bach, Walter L., Portuguese Bend. Died August 5, 1964, in Long Beach, aged 71, of cancer. Graduate of the University of Colorado School of Medicine, Denver, 1920. Licensed in California in 1938. Doctor Bach was a retired member of the Los Angeles County Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✣

Barr, Joseph H., Modesto. Died August 8, 1964, in Oakland, aged 53. Graduate of the University of Nebraska College of Medicine, Omaha, 1940. Licensed in California in 1947. Doctor Barr was a member of the Stanislaus County Medical Society.

✣

Coffin, Harry Welrose, Los Angeles. Died May 6, 1964, in Los Angeles, aged 83, of pneumonitis. Graduate of State University of Iowa College of Medicine, Iowa City, 1917. Licensed in California in 1918. Doctor Coffin was a member of the Los Angeles County Medical Association, a life member of the California Medical Association, and a member of the American Medical Association.

✣

Cowan, Louis E., Sherman Oaks. Died July 18, 1964, in Van Nuys, aged 58, of coronary arteriosclerosis. Graduate of the Université de Genéve Faculté Médicine, Switzerland, 1949. Licensed in California in 1951. Doctor Cowan was a member of the Los Angeles County Medical Association.

✣

Dalton, Charles E., Maywood. Died July 20, 1964, aged 42. Graduate of George Washington University School of Medicine, Washington, D.C., 1950. Licensed in California in 1955. Doctor Dalton was a member of the Los Angeles County Medical Association.

✣

Entin, Oscar Louis, Granada Hills. Died August 7, 1964, in Granada Hills, aged 48, of acute myocardial infarction. Graduate of Rush Medical College, Chicago, Illinois, 1939. Licensed in California in 1951. Doctor Entin was a member of the Los Angeles County Medical Association.

✣

Griffin, Richard Anthony, Covina. Died August 2, 1964, in Seal Beach, aged 53, of a coronary. Graduate of the University of Southern California School of Medicine, Los Angeles, 1938. Licensed in California in 1939. Doctor Griffin was a member of the Los Angeles County Medical Association.

✣

Hawkinson, Lloyd F., Piedmont. Died August 2, 1964, in Piedmont, aged 65, of pulmonary embolus. Graduate of Georgetown University School of Medicine, Washington, D.C., 1923. Licensed in California in 1938. Doctor Hawkinson was a member of the Alameda-Contra Costa Medical Association.

✣

Hewitt, Arthur William, Los Angeles. Died July 26, 1964, in La Sierra, aged 86, of congestive heart failure. Graduate of George Washington University School of Medicine, Washington, D.C., 1908. Licensed in California in 1923. Doctor Hewitt was a retired member of the Los Angeles County Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✣

LaMar, Norvelle Chappell, San Diego. Died August 1, 1964, in San Diego, aged 67. Graduate of Indiana University School of Medicine, Bloomington-Indianapolis, 1925. Licensed in California in 1961. Doctor LaMar was a member of the San Diego County Medical Society.

✣

Marcus, Herman, San Francisco. Died July 15, 1964, in San Francisco, aged 70. Graduate of the College of Physicians and Surgeons of San Francisco, 1918. Licensed in California in 1918. Doctor Marcus was a member of the San Francisco Medical Society.

✣

Mattison, George, Glendale. Died August 6, 1964, in Glendale, aged 77. Graduate of Creighton University School of Medicine, Omaha, Nebraska, 1913. Licensed in California in 1931. Doctor Mattison was a retired member of the Los Angeles County Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✣

McGrath, Allen Kier, Sonoma. Died July 21, 1964, in Sonoma, aged 67. Graduate of the University of California School of Medicine, Berkeley-San Francisco, 1924. Licensed

in California in 1924. Doctor McGrath was a retired member of the Napa County Medical Society and the California Medical Association, and an associate member of the American Medical Association.

✤

Meredith, Richard Screven, San Leandro. Died August 11, 1964, in Oakland, aged 54. Graduate of the University of Pennsylvania School of Medicine, Philadelphia, 1935. Licensed in California in 1962. Doctor Meredith was a member of the Los Angeles County Medical Association.

✤

Miller, Theodore Kienke, Napa. Died July 30, 1964, in Napa, aged 70, of cancer. Graduate of the College of Medical Evangelists, Los Angeles, 1922. Licensed in California in 1922. Doctor Miller was a member of the Napa County Medical Society.

✤

Olson, Frederick A., Pomona. Died July 10, 1964, in Los Angeles, aged 80, of coronary thrombosis. Graduate of Rush Medical College, Chicago, Illinois, 1908. Licensed in California in 1931. Doctor Olson was a member of the Los Angeles County Medical Association.

✤

Richhart, Don R., Downey. Died July 18, 1964, in Downey, aged 55, of a coronary. Graduate of the College of Osteopathic Physicians and Surgeons, Los Angeles, 1945. Licensed in California in 1945. M.D. degree from California College of Medicine, 1962. Doctor Richhart was a member of the Forty First Medical Society.

Scheck, Kay C., Los Angeles. Died August 7, 1964, in Baldwin Hills, aged 51, of heart disease. Graduate of the University of Tennessee College of Medicine, Memphis, 1937. Licensed in California in 1943. Doctor Scheck was a member of the Los Angeles County Medical Association.

✤

Sisson, Merrell A., San Francisco. Died August 6, 1964, aged 55. Graduate of the University of Oregon Medical School, Portland, 1934. Licensed in California in 1946. Doctor Sisson was a member of the San Francisco Medical Society.

✤

Tasker, Dain L., Oceanside. Died July 27, 1964, in Oceanside, aged 91, of arteriosclerotic heart disease. Graduate of Pacific College of Osteopathy, 1898. Doctor Tasker was a member of the Forty First Medical Society.

✤

Todorovic, D. D., Mt. Shasta. Died August 7, 1964, in Mt. Shasta, aged 60, of a brain tumor. Graduate of Northwestern University Medical School, Chicago, Illinois, 1929. Licensed in California in 1930. Doctor Todorovic was a member of the Siskiyou County Medical Society.

✤

Tufts, F. Elwood, Sacramento. Died August 6, 1964, in Sacramento, aged 57. Graduate of the College of Medical Evangelists, Loma Linda, Los Angeles, 1940. Licensed in California in 1940. Doctor Tufts was a member of the Sacramento Society for Medical Improvement.



Nurse Services in Noise Control Programs

The California Medical Association and the California Nurses' Association have joined in a statement of the propriety of the registered nurse's performing certain services in the implementation of the noise control orders for industry set up by the Division of Industrial Safety of the Department of Industrial Relations. The statement follows:

1. *Audiometric testing* may be done by a nurse who has been instructed in the use of audiometric equipment by a qualified instructor. The nurse would explain the audiometric testing as a screening procedure to the employee. The nurse would record the observations obtained from the audiometric testing equipment; she could not interpret the observations; she could not diagnose the hearing status of the employee; she could not prescribe treatment.

2. *Before ear plugs or other noise protective appliances are fitted* for an employee, an otological examination and diagnosis are necessary. Such a diagnosis can only be made by a licensed physician. The California industrial hearing conservation program was enacted to protect the employee, and the individual otological examination, evaluation and diagnosis is one step for the protection of the employee, and therefore also for the employer.

(a) An occupational health nurse may fit molded ear plugs or other protective hearing appliances if the nurse has a doctor's order for a specific employee to fit the ear plugs, or other hearing protective appliances for the employee, and the nurse knows how to fit the device.

(b) The nurse may irrigate ears as part of fitting protective hearing appliances if there is a physician's order based upon his diagnosis of the employee's condition.

3. *Records and reports*

(a) The hearing record should be a part of the total medical record; it should be properly dated and signed and should note any instructions given to the employee; and should include a notation of the issuance of protective equipment, the date and the kind of equipment issued.

(b) On the individual's medical record, the following should be recorded:

(1) Work history.

(2) Screening tests and nursing observations

(3) Medical evaluation of ears and orders by the physician.

(4) Instructions to employees as to the use and the maintenance of protective equipment.

(5) Date and type of issued protective equipment, and date for follow-up visit.

(c) If an outside consultant, with perhaps a mobile unit, does the testing, a record may also be kept by the outside consultant if this is acceptable to the employer and to the employee. The occupational health nurse's records would show this acceptance of the second set of records.

4. *Testing equipment—Maintenance*

(a) Within company policy and guiding regulations the occupational health nurse can arrange a schedule for periodic calibration of the audiometric testing equipment by a qualified technician and/or the service representative of the vendor. A qualified industrial hygienist or safety engineer would be the person to investigate and evaluate the environmental conditions, including noise levels and controls.

(b) The employee should be instructed in the use of and hygienic care of the equipment issued to him by the physician or the occupational health nurse, and where indicated, by representatives of the plant safety committee. Within each agency, administrative policies concerning individual employee responsibility for the care of protective equipment should be established.

5. *Periodic examinations*

Good practice would indicate that there should be periodic examinations of the employees. The plant physician, the employer and the occupational health nurse in charge, should work together in determining the timing, the scope, and the extent and condition of periodic examinations.

6. *Visitors*

Management, in its written policies, shall determine if the exposure and need for protection of a visitor requires action. The plant physician should state what temporary noise protection is to be supplied, and by whom.

General

The occupational health nurse should work with all persons involved in health and safety (including medicine, management, labor, industrial hygiene, safety, insurance) in planning, developing and implementing the company's hearing conservation program.

COMMITTEE ON OCCUPATIONAL HEALTH
CALIFORNIA MEDICAL ASSOCIATION

PUBLIC HEALTH REPORT

MALCOLM H. MERRILL, M.D., M.P.H.
Director, State Department of Public Health

IT IS UNLIKELY that major influenza outbreaks will occur in California during the 1964-65 disease season. As in other inter-epidemic years, however, focal outbreaks might be expected.

During 1963-64, influenza A2 was widely prevalent along the West Coast. Although influenza A commonly occurs in two to three-year cycles, it would seem, in the face of the extensive 1962-63 outbreak and the California involvement the following year, that a major outbreak would be unlikely this year.

A nationwide epidemic of influenza B was last observed in the United States during 1961-62. During 1963-64, influenza B in epidemic proportions was observed in Japan. Possibilities that the Japanese influenza B epidemics might herald outbreaks in California during the coming year cannot be completely dismissed.

It seems unlikely, however, in view of the relatively rare occurrence of major epidemics of type B, that California would experience more than scattered, limited outbreaks this season.

Since its introduction, influenza vaccine has been shown in repeated trials to give substantial protection — 60 to 80 per cent — against the epidemic disease. Vaccination should begin as soon as practicable after September 1 and ideally should be completed by mid-December. In any case a two-week delay in the development of antibodies may be expected.

* * *

The department has begun a study of the occurrence of cancer among Japanese citizens of the State, part of a coordinated project being conducted in Japan, Hawaii and California, and supported by the National Cancer Institute.

Two cancer sites, stomach and lung, were selected because Japanese people have an increased susceptibility to cancer of the stomach, while cancer of the lung occurs less frequently among Japanese in Japan than among the people of the Western countries. Purpose of the study is to determine whether the occurrence of these cancers change as Japanese people adapt to other cultural surroundings.

Interviews will be sought in 1,500 households and among members 35 years of age and older. Information about dietary and other habits that may have some relationship to the occurrence of cancer will be requested. The study is limited to the collection of interview information. No examinations or laboratory tests are involved.

* * *

Last year there were 650 drownings in California, 489 of which were associated with recreational activities or occurred in recreational areas. The other 161 were the result of suicides, bathtub accidents, or other mishaps.

Of particular concern are the 100 preventable drownings that took place in home swimming pools. More than half of these deaths occurred to children under the age of five with 24 under one year of age. About 75 per cent of them were reported from three counties—Los Angeles, Orange and San Bernardino. This is probably due to the large population in these areas and the large number of home pools.

Drownings in home pools could be avoided by simple preventive measures, such as: Enclosing pools with a fence and self-closing gate which cannot be opened by small children; having rescue equipment available at poolside; having all members of the family learn the technique of mouth-to-mouth resuscitation. In addition, children should be watched continuously when they are in the pool area.

* * *

Since the department some months ago began routine testing of hospital meals as part of its radiological surveillance program, the levels of radioactivity found have been far below those at which consideration should be given to protective action from the standpoint of health.

The samples, which are gathered from all areas of the State, are analyzed for their content of various biologically important radioactive isotopes, including Strontium 90, Cesium 137 and Radium 226.

* * *

We have had to reemphasize again this summer the great danger in using pitchers and other containers which contain copper, cadmium, or related heavy metals for the preparation of acid drinks.

Two outbreaks of illness caused by the drinking of soft drinks occurred recently. In the first episode 23 youngsters became severely ill shortly after drinking pink lemonade which was stored in a cadmium plated container. In the second occurrence, five children became ill after drinking a fruit drink which had been prepared and stored in a silver over copper pitcher.

CMA CALIFORNIA MEDICAL ASSOCIATION

1965 Annual Scientific Assembly

San Francisco March 28-31, 1965

General Theme

VIROLOGY

Featured Speakers:

GEORGE GEE JACKSON, M.D. Professor of Medicine, University of Illinois, Chicago
HENRY KEMPE, M.D. Professor of Pediatrics, University of Colorado, Denver
HILARY KOPROWSKI, M.D. Director, The Wistar Institute, Philadelphia
IGOR TAMM, M.D. The Rockefeller Institute, New York City
ROBERT R. WAGNER, M.D. . . Professor of Microbiology, The John Hopkins University, Baltimore

CALL FOR SCIENTIFIC PAPERS, MEDICAL MOTION PICTURES AND SCIENTIFIC EXHIBITS

Your participation will make this assembly a success. If you have a paper (it need not be on virology) write to the appropriate Section Representative below.

PROGRAM REPRESENTATIVES OF THE SCIENTIFIC SECTIONS

ALLERGY Leo Melcher, M.D.
150 Arch Street, Redwood City

ANESTHESIOLOGY . . . Bruce M. Anderson, M.D.
439 - 30th Street, Oakland

DERMATOLOGY AND SYPHILOLOGY . . Charles George Steffen, M.D.
250 W. Badillo, Covina 91722

EAR, NOSE AND THROAT Thomas L. Soss, M.D.
333 N. San Mateo Drive, San Mateo

(Copy to: Irwin Harris, M.D.
4759 Hollywood Blvd., Los Angeles 90027)

EYE Byron H. Demorest, M.D.
5301 F Street, Sacramento 95819

GENERAL PRACTICE . . Leland B. Blanchard, M.D.
678 East Santa Clara Street, San Jose 95112

GENERAL SURGERY . . . Newlin Hastings, M.D.
1136 W. 6th Street, Los Angeles 90017

INDUSTRIAL MEDICINE AND SURGERY Rufus J. Walker, M.D.
4122 Holly Knoll Dr., Los Angeles 90027

INTERNAL MEDICINE . . James H. Thompson, M.D.
490 Post Street, San Francisco 94102

OBSTETRICS AND GYNECOLOGY Ralph L. Hoffman, M.D.
2111 Fifth Avenue, San Diego 92101

ORTHOPEDICS G. Wilbur Westin, M.D
2300 S. Hope Street, Los Angeles 90007

PATHOLOGY AND BACTERIOLOGY Melvin B. Black, M.D.
1580 Valencia Street, San Francisco 94110

PEDIATRICS Jack W. Bills, M.D.
14914 Sherman Way, Van Nuys 91405

PHYSICAL MEDICINE . . . O. Leonard Huddleston, M.D.
710 Wilshire Boulevard, Santa Monica

PREVENTIVE MEDICINE AND PUBLIC HEALTH Henrik L. Blum, M.D.
P. O. Box 871, Martinez

PSYCHIATRY AND NEUROLOGY Allen J. Enelow, M.D.
910 Via de la Paz, Palisades 90272
and
George Y. Abe, M.D.
Metropolitan State Hospital, Norwalk 90650

RADIOLOGY John C. Bennett, M.D.
2200 Hayes Street, San Francisco 94117

UROLOGY Carl K. Pearlman, M.D.
1518 N. Sycamore, Santa Ana

If you have a medical motion picture or a scientific exhibit, write the California Medical Association Committee on Scientific Assemblies, 693 Sutter Street, San Francisco, for application forms today.

PLAN NOW TO ATTEND THE 1965 ANNUAL SCIENTIFIC ASSEMBLY

INFORMATION

Control of Cancer Quackery

THE 1959 California Legislature, in Senate Bill No. 194, gave the Department of Public Health responsibility for the enforcement of a program to protect the public from unorthodox or unproven methods for the diagnosis, treatment, alleviation or cure of cancer.

To assist and advise the department, this antiquackery law authorized the appointment of a 15-member Cancer Advisory Council consisting of nine physicians and surgeons, two representatives from cancer research institutes, three others who are not physicians and surgeons, and the Director of the Department of Public Health. The current membership of the council is as follows:

Joseph F. Ross, M.D., Los Angeles, Chairman
Sol R. Baker, M.D., Beverly Hills
Mrs. Robert L. Brown, Van Nuys
John W. Cline, M.D., San Francisco
Renato Dulbecco, M.D., La Jolla
L. Henry Garland, M.D., San Francisco
Mr. Seymour Graff, San Marino
Edith R. Lindly, Ed.D., Fresno
Thomas S. Nelsen, M.D., Palo Alto
O. B. Pratt, M.D., Los Angeles
Sol Silverman, Jr., D.D.S., San Francisco
M. H. Simmers, M.D., Los Angeles
Jesse L. Steinfeld, M.D., Los Angeles
David A. Wood, M.D., San Francisco
Malcolm H. Merrill, M.D., Berkeley, ex-officio member

The legislation requires anyone offering an agent for the diagnosis or treatment of cancer to furnish, on demand, samples for investigation or testing by the department. When it has been established that an agent is misrepresented or ineffective, the department may order its use discontinued by issuance of a cease and desist order. This order may follow consent to a stipulated order by the accused without further administrative procedure, may be based on the conclusive presumption feature of the law or may follow the adoption of a prohibitory regulation by the State Board of Public Health. In the latter two instances the cease and desist action must be based on the recommendation of a hearing officer after an accusatory hearing. These hearings, although subject to judicial review, are administrative in nature, and follow a procedure less formal than that ordinarily employed in courts of law.

Within the State Department of Public Health, a Cancer Diagnosis and Therapy Evaluation Unit has been established to furnish staff service to the Council and to carry out the antiquackery program. This unit is currently staffed by a physician as head, two field representatives and appropriate secretarial help.

During the time the program has been in operation, the following action has been taken by the State Department of Public Health on recommendation of the Council:

An order by stipulation against Catherine E. Harmon, D.C., to cease and desist from the use of an electronic device, the "Harmonizer," in the treatment of cancer.

An order against Charlotte M. Steiner, D.C., to cease and desist from the use of a grape diet and Mucorhicin in the treatment of cancer.

Orders by stipulation against Willoughby W. Sherwood, M.D., Charles L. Hawk, M.D., Nelsen E. Mathison, (D.O.) M.D., John H. Friend, (D.O.) M.D., and Francis M. Altig, (D.O.) M.D., to cease and desist from the use of the Hoxsey remedy in the treatment of cancer.

An order against Wendell G. Hendricks, D.O., to cease and desist from the use of Koch's oxidation catalyst; Cancer antitoxin; Rosete's treatment; animal cell treatment, Canadian; animal cell treatment, Swiss (Siccacell); and Lincoln inhalation treatment.

Adoption of regulations by the State Board of Public Health which prohibit the prescription, administration, sale or other distribution of the following diagnostic and treatment agents in the diagnosis, treatment, alleviation or cure of cancer: Bolen Test, Hoxsey Remedy, Koch Synthetic Antitoxin, Lincoln Staphage Lysate, Laetrile and Mucorhicin.

In addition, investigations have been undertaken with respect to such agents as the Anthrone diagnostic test for cancer and Krebiozen.

The department has received pledges of support from the deans of the schools of medicine in California, individual physicians and other scientists, State Boards of Medical and Osteopathic Examiners and other groups. Support of all practicing physicians and of all agencies in the state is needed and is earnestly solicited. This support may take any or all of the following forms:

1. When treatment of patients with unproven methods comes to the attention of any physician, society, bureau or other agency, the local county medical society, local health officer, or the local

branch of the American Cancer Society should be notified and requested to pass the information on to the State Department of Public Health, 2151 Berkeley Way, Berkeley 4, California. The latter agency may also be notified directly by mail or telephone to Dr. K. F. Ernst, THornwall 3-7900, extension 321.

2. Historical notes to record methods of diagnosis, claims for and details of treatment, name of the treatment and of the clinic or individual offering it, and the cost of the treatment, should be made while still fresh in the patient's mind. If it is suspected that the diagnosis of cancer is false, diagnostic studies to confirm the diagnosis or to show that it is incorrect should be performed after making arrangements with the State Department of Public Health.

3. Objective findings for comparison with those before treatment, if known by the physician or stated by the patient, should be recorded.

Factual or opinion testimony by physicians or other scientists regarding physical findings or the efficacy of a given remedy is of tremendous value when a case is being considered before a hearing officer.

MALCOLM H. MERRILL, M.D.

Coordination Plan for Continuing Medical Education

A Report by the Committee on Continuing Medical Education of the Scientific Board of the California Medical Association

CONTINUING MEDICAL EDUCATION, a key professional goal among physicians throughout the nation, is threatened in California by overabundance. For this reason, a program of *conservation through coordination* has been announced by the California Medical Association in an effort to utilize more effectively the resources of the profession.

The background for the newly conceived program is an exhaustive survey made in 1959-60 by the Ad Hoc Committee on Continuing Education and Scientific Activities of the CMA with respect to continuing medical education in California. Results of that survey are shown in Table 1. The ad hoc committee concluded that there was a more than adequate number of formal courses offered by a great variety of sponsoring agencies and that there was wasteful duplication of effort and less than maximum efficiency in the utilization of professional and financial resources. Furthermore, this situation made it necessary for the practicing physician to forego courses that he might have wished to attend because of conflicts in scheduling.

The overabundance of educational programs reported in the 1959-60 survey has become intensified since that time. A comparison of postgraduate courses offered by medical schools within the State and by California Medical Association in conjunction with medical schools for 1962-63, as against the survey year, is shown in Table 2.

There has also been a comparable growth in the educational opportunities offered by hospitals, voluntary health agencies, specialty societies and other groups. This proliferation of educational opportu-

TABLE 1.—*Survey of Postgraduate Courses and Continuing Education Meetings in California,* July 1, 1959 – July 30, 1960*

Sponsors	Courses		Hours of Instruction		Physician Enrollees		Physician Hours of Study		Faculty or Speakers	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
1. Medical School and CMA-Medical School	131	49.2	5,704	79.2	10,865	34.7	318,882	55.4	1,622	54.2
2. Specialty Societies	42	15.8	446	6.2	6,526	20.9	71,417	12.4	676	22.6
3. Voluntary Health Agencies	34	12.8	282	3.9	5,525	17.8	69,193	12.0	209	7.0
4. County Societies and Miscellaneous	11	4.2	85	1.2	1,796	5.6	10,847	1.9	72	2.3
5. Hospitals	48	18.0	681	9.5	6,564	21.0	105,088	18.3	415	13.9
Total	266	100.0	7,198	100.0	31,276	100.0	575,427	100.0	2,994	100.0

*This survey does not include scientific meetings of hospital staffs, county medical societies or of state and national medical organizations.

SOURCE: Report of Ad Hoc Committee on Continuing Education and Scientific Activities of the California Medical Association, March 18, 1961.

TABLE 2.—*Postgraduate Courses Sponsored by Medical Schools and by the California Medical Association in Cooperation with Medical Schools in California, July 1, 1959-June 30, 1960 and July 1, 1962-June 30, 1963*

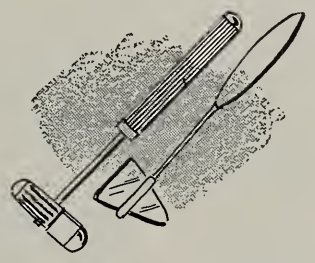
Courses, Hours of Instruction, Enrollees, Faculty	*Year*		*Per Cent Change*
	1959-60	*1962-63*	
Number of courses	131	179	+36.6
Number of hours of instruction	5,704	5,394	− 5.4
Number of physician enrollees	10,865	14,395	+32.5
Number of faculty or speakers	1,622	2,433	+50.0

nities has placed an unrealistic burden on physicians who are called upon to plan the programs and on teachers to carry them out. In addition, there has been the real possibility of a dilution in quality. The new coordination service to be offered by the Scientific Board of the California Medical Association through its Committee on Continuing Medical Education will have as its first objective the elimination of conflict among all continuing education meetings in the State with special reference to time, location and subject.

County medical societies will be asked to serve as the instrumentality for the clearance-of-conflict service. Each will be asked to set up its own mechanism for clearing meetings scheduled within its geographical jurisdiction. Successful programs which have already been established by the Orange County Medical Association and the Sacramento County Medical Society may serve as models for this new effort.

Each organization in California which sponsors continuing medical education for physicians will be invited to participate in the program by submitting its proposed programs to its county medical society for clearance. Should a county society not offer this service, a program may be submitted directly to the Committee on Continuing Medical Education of the California Medical Association, which will maintain a statewide listing of courses offered.

Conferences on November 14 in Los Angeles and November 15 in San Francisco will be held to provide orientation concerning this new service and to obtain the points of view of all organizations which might be involved. Representatives of county medical societies and other relevant groups will be invited to the conferences to cooperate with the California Medical Association in launching the new program and in planning additional ways in which to implement its objectives.



NEWS & NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

The California College of Medicine has announced the appointment of three distinguished physicians to head **departments of the faculty.**

Dr. Thomas L. Nelson assumes the position of chairman and professor of pediatrics. He moves from the University of Kentucky College of Medicine where he was professor of pediatrics.

Dr. Bernard J. O'Loughlin has accepted the professorship and chair of the Department of Radiology. Previously he had been professor of radiology and head of the Diagnostic Division and Chief of Pediatric Radiology at the University of California, Los Angeles.

Dr. Bernard O'Connor has been appointed chief of the Division of Neurology and associate professor of medicine. He is head of the neurology service at the Los Angeles County Rancho Los Amigos Hospital.

* * *

One of the nation's first **training programs** designed to increase the number of physicians well equipped to handle the rising incidence of **pulmonary disease** is being established at the University of Southern California School of Medicine. "Community and industrial air pollution, smoking, and respiratory infections combine to cause many lung difficulties," according to Dr. Oscar J. Balchum, Hastings associate professor of medicine at USC, who is in charge of the new program.

Supported by the Air Pollution Division of the United States Public Health Service, the training program in pulmonary diseases is being conducted at Los Angeles County General Hospital.

* * *

Divergent viewpoints on epidemiology and treatment of coronary heart disease and the latest etiologic knowledge and theory of arrhythmias will be presented by eight nationally known scientists at the 33rd Annual Fall **Symposium on Heart Disease** of the Los Angeles County Heart Association September 30 and October 1 at the Statler Hilton Hotel.

SAN FRANCISCO

The California Academy of General Practice will hold its 1964 Scientific Assembly October 24 to 28 at the new San Francisco Hilton. Among **guest speakers** are Sir John Bruce, professor of clinical surgery, University of Edinburgh; Dr. Edward H. Rynearson of the Mayo Clinic, Dr. N. Paul Isbell, clinical professor of obstetrics and gynecology, University of Colorado, Dr. Malcolm A. McCannel, clinical assistant professor of ophthalmology, University of Minnesota, and Dr. John J. Bonica, professor and chairman of department of anesthesiology, University of Washington. Dr. Edward R. Annis, a past president of the American Medical Association, will give the opening address at the meeting.

On the program from Northern California are Drs. Carroll M. Brodsky, J. Englebert Dunphy, Eugene Farber, Peter H. Forsham, Ralph J. Gampell, L. Henry Garland, Donald Macrae and Forrest M. Willett. Southern California speakers are Drs. Francis Y. K. Lau, Morton H. Maxwell, James V. McNulty, Hurley L. Motley, Davis J. Sayles and Robert T. Plumb.

* * *

Dr. Lloyd Hollingsworth Smith, Jr., became professor and chairman of the Department of Medicine at the University of California Medical Center, San Francisco, on September 1. His appointment was announced by U.C. President Clark Kerr and Chancellor J. B. deC. M. Saunders of the San Francisco campus.

As department chairman, Dr. Smith succeeded **Dr. Henry D. Brainerd,** who became chief of the University's service in internal medicine at the San Francisco General Hospital.

Dr. Smith comes to San Francisco from the faculty of Harvard Medical School and the staff of Massachusetts General Hospital.

■ CALIFORNIA PHYSICIANS are urged to "reevaluate most carefully" the need for prescribing the analgesic Darvon® (dextropropoxyphene hydrochloride) which has become the single most expensive drug being used in the Public Assistance Medical Care Program.

Concern over the amounts of Darvon currently being prescribed was voiced this month by the Advisory Committee on Medical Care to the State Department of Social Welfare.

"The committee does not want to see the use of Darvon restricted by regulation," said Samuel R. Sherman, committee chairman, "but the amount of money being spent for it is tremendous."

He reported that over $90,000 per month has been spent recently in the state to fill prescriptions for it and that it's annual cost is over $1,000,000—or one-fifteenth of the total cost of all drugs under the PAMC program.

"Committee members realize it is a very fine drug," he said. "If it is only being prescribed in needed amounts and in cases where it is truly necessary, then its cost is justified. But, amounts currently prescribed and the frequency with which it is ordered are good reasons for a reevaluation of the absolute need for prescribing the drug rather than less expensive preparations."

"At its last session, the Legislature imposed a ceiling on welfare medical care expenditures. In an effort to conserve funds available for the best possible overall use, the committee urges physicians to use less costly preparations when they might be expected to be just as effective," he said.

GENERAL

The State Board of Public Health will hold hearings beginning at 9:00 a.m. on October 20, 1964 in Room 123—2151 Berkeley Way, Berkeley, and on October 22, 1964, in Room 1138, State Office Building, 107 South Broadway, Los Angeles, to consider **regulations to prohibit** the prescription, administration, sale or other distribution of the **Anthrone** test and the agent **"Krebiozen"** in the diagnosis, treatment, alleviation and/or cure of cancer.

Persons interested in the proposed regulations are invited to attend the hearings. They will be given the opportunity to present their statements, arguments or contentions concerning these proposed regulations.

EDUCATION NOTICES

Meetings and Courses

COMMITTEE ON CONTINUING MEDICAL EDUCATION

THIS BULLETIN of the dates of continuing education programs and the meetings of various medical organizations in California is supplied by the Committee on Continuing Medical Education of the California Medical Association. In order that they may be listed here, please send communications relating to your future meetings or postgraduate courses to Committee on Continuing Medical Education, California Medical Association, 693 Sutter Street, San Francisco, California 94102.

Medical Meetings

SEPTEMBER MEETINGS

September 10-November 5—**Stockton Postgraduate Study Club.** Scottish Rite Temple, 33 West Alpine, Stockton. Thursdays weekly, except October 1. Contact: James V. Roche, M.D., program chairman, 645 West Harding Way, Stockton.

September 15-October 20 — **San Francisco Academy of General Practice Fort Miley Symposium.** Auditorium, Veterans Administration Hospital, San Francisco. Six consecutive Tuesdays. Contact: Forrest M. Willett, M.D., 42nd Avenue and Clement Street, San Francisco 94121.

September 19—**Second Northern California Athletic Injury Conference.** Sponsored by Butte-Glenn Medical Society and Chico State College. To be held at Chico State College 8:30 a.m. to 5:30 p.m., Saturday. Contact: Robert S. Johnson, M.D., chairman, 4 Cohasset Circle, Chico.

September 21-24—**Poison Information Activities: Whither Now?** Sponsored jointly by the Childrens Hospital of Los Angeles, the Thomas J. Fleming Poison Information Center and the California State Department of Public Health. Los Angeles. Monday-Thursday. Tuition: $40. Contact: W. H. Bucher, M.D., director, Childrens Hospital of Los Angeles, 4614 Sunset Blvd., Los Angeles 90027.

September 24-26—**American College of Obstetricians and Gynecologists** (District 8). San Diego. Thursday-Saturday. Contact: Donald F. Richardson, executive director, 79 West Monroe, Chicago 3.

September 26-29—**Annual Western Divisional Meeting of the American Psychiatric Association.** St. Francis Hotel, San Francisco. Saturday-Tuesday. Contact: William Bellamy, M.D., 450 Sutter Street, San Francisco 94108.

September 27-October 2—**Flying Physicians Association.** Tenth Annual Meeting. Riviera Hotel, Palm Springs. Sunday-Friday. Contact: John C. Chatterton, staff representative, Flying Physicians Association, 332 South Michigan Avenue, Chicago 60604.

September 30-October 1—**Annual Professional Symposium on Heart Disease.** Statler Hilton Hotel, Los Angeles. Wednesday-Thursday. Fee: $25. Contact: Mr. Chauncey Alexander, executive director, Los Angeles County Heart Association, 2405 West 8th Street, Los Angeles 90057.

September 30-October 2—**34th Annual Postgraduate Symposium on Heart Disease**—St. Francis Hotel, San Francisco. Contact: Mr. Gene C. Taylor, executive director, San Francisco Heart Association, 259 Geary Street, San Francisco.

OCTOBER MEETINGS

October 5-7—**Basic Mechanisms in Internal Medicine.** Sponsored by the American College of Physicians. Los Angeles. Monday-Wednesday. Fees: members, $60; nonmembers, $100. Contact: Edward C. Rosenow, Jr., M.D., The American College of Physicians, 4200 Pine Street, Philadelphia, Pennsylvania 19104.

October 8-10—**The American College of Physicians Fall Sectional Meeting.** Biltmore Hotel, Los Angeles. Thursday-Saturday. Contact: Edward C. Rosenow, Jr., M.D., executive director, The American College of Physicians, 4200 Pine Street, Philadelphia 4, Pennsylvania.

October 11-16—**American Society of Plastic and Reconstructive Surgeons.** Fairmont Hotel, San Francisco. Sunday-Friday. Contact: Paul P. Pickering, M.D., executive secretary, 2850 Sixth Avenue, Suite B, Lower Level, San Diego.

October 16-17—**Western Industrial Medical Association.** Biltmore Hotel, Los Angeles. Friday-Saturday. Contact: Christine Einart, M.D., executive secretary, 2151 Berkeley Way, Berkeley 4.

October 23-25—**California Society of Internal Medicine.** Mark Thomas Hotel, Monterey. Friday-Sunday. Contact: Mrs. Nancy V. Louw, executive secretary, 350 Post Street, San Francisco 94108.

October 25-28—**California Academy of General Practice 16th Annual Scientific Assembly.** Hilton Hotel, San Francisco. Sunday-Wednesday. Sir John Bruce, Professor of Clinical Surgery, University of Edinburgh, Scotland, will be one of the principal speakers. Contact: Academy of General Practice, No. 9 First Street, San Francisco.

NOVEMBER MEETINGS

November 3-6—**Present Concepts in Internal Medicine.** Letterman General Hospital, San Francisco. Tuesday-Friday. Contact: Commanding General, Attn.: MEDES-PT, Letterman General Hospital, San Francisco 94129.

November 4-7—**Nevada State Medical Association and Reno Surgical Society—Joint Meeting.** Reno, Nevada. Wednesday-Saturday. Registration: $20. Contact: Nelson B. Neff, executive secretary, Nevada State Medical Association, 3660 Baker Lane, Reno.

November 7—**Forty First Medical Society Convention: "Man's Reaction to Catastrophe."** Riviera Hotel, Palm Springs. Saturday. Contact: John M. Addington, administrative director, Forty First Medical Society, 4775 Santa Monica Blvd., Los Angeles 90029.

November 11-12—**Pacific Coast Fertility Society Symposium. "Population Growth—A Medical Responsibility."** El Mirador Hotel, Palm Springs. Contact: Miss Dee Davis, executive secretary, Pacific Coast Fertility Society, 5410 Wilshire Blvd., Los Angeles 90036.

November 12-15—**Annual Meeting of the Pacific Coast Fertility Society.** El Mirador Hotel, Palm Springs. Fee: $15 members, $25 non-members. Contact: Pacific Coast Fertility Society, 5410 Wilshire Blvd., Los Angeles 90036.

November 12-15—**San Diego Chapter of the California Academy of General Practice Scientific Symposium.** Flamingo Hotel, Las Vegas. Contact: Vincent F. Biondo, M.D., 5548 El Cajon Blvd., San Diego 92115.

November 14—**Annual Institute in Child Psychiatry for Pediatricians.** Reiss-Davis Clinic for Child Guidance. Co-sponsored by the Southern California Chapter of the American Academy of Pediatrics. Saturday. Contact: R. L. Motto, M.D., director, Reiss-Davis Clinic, 9760 West Pico Blvd., Los Angeles 90035.

DECEMBER MEETINGS

December 1-4—**Annual Presentation of the Postgraduate Course in Cardiology: "The Heart in the Electronic Age."** Scripps Clinic and Research Foundation, La Jolla. Tuesday-Friday. Contact: Harold M. Lowe, M.D., Scripps Clinic and Research Foundation, 476 Prospect Street, La Jolla.

December 2-4 — **West Coast Allergy Society Annual Meeting.** Ambassador Hotel, Los Angeles. Wednesday-Friday. Contact: Jack M. Chesebro, executive secretary, 1818 S.E. Division, Portland 2.

December 9—**Symposium Seminars on Respiratory Disease.** Sponsored by the Tuberculosis and Health Association of Alameda County. Jack London Inn, Jack London Square, Oakland. Wednesday. Contact: E. Ronald Riggall, M.D., program chairman, 121 East 11th Street, Oakland 6.

FUTURE MEETINGS IN 1965

January 20—**Annual Midwinter Symposium on Heart Disease.** Statler Hilton Hotel, Los Angeles. Wednesday. Contact: Mr. Chauncey Alexander, executive director, Los Angeles County Heart Association, 2405 West 8th Street, Los Angeles 90057.

January 22-24—**Annual Meeting of the Southern California Chapter, American College of Surgeons.** Palm Springs. Sunday-Tuesday. Contact: Russell Smith, M.D., chairman, 1930 Wilshire Blvd., Los Angeles.

January 27-30 — **The American Group Psychotherapy Association.** San Francisco. Wednesday-Saturday. Contact: Donald A. Shaskan, M.D., president, 49 Fourth Street, San Francisco.

January 29-31—**Clinical Conference in Pediatric Anesthesiology.** Childrens Hospital of Los Angeles. Friday-Sunday. Contact: M. Digby Leigh, M.D., Childrens Hospital of Los Angeles, 4614 Sunset Boulevard, Los Angeles 90027.

February 13-14 — **Pediatric Surgery Symposium.** Presented by Childrens Hospital of Los Angeles. Saturday-Sunday. Contact: Newlin Hastings, M.D., program chairman, 4614 Sunset Blvd., Los Angeles 90027.

February 20-21—**Pediatric Urologic Seminar.** Childrens Hospital, Los Angeles. Saturday-Sunday. Contact: H. H. Edelbrock, M.D., 6753 Hollywood Blvd., Los Angeles 90028.

March 28-31—**CALIFORNIA MEDICAL ASSOCIATION 94th Annual Session.** Scientific theme: "Urology." Fairmont Hotel, Mark Hopkins Hotel, San Francisco. Sunday-Wednesday. Contact: Mr. John Hunton, executive secretary, 693 Sutter Street, San Francisco 94102.

April 4-8—**Annual Clinical Meeting of the American College of Obstetricians and Gynecologists.** Civic Auditorium, San Francisco. Sunday-Thursday. Contact: Robert A. Kimbrough, M.D., director, 79 West Monroe Street, Chicago 60603.

April 9-15—**American Academy of General Practice.** San Francisco. Friday-Thursday. Contact: Mac F. Cahal, J.D., Volker Boulevard at Brookside, Kansas City 12, Mo.

Postgraduate Education

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Presbyterian Medical Center

November 14—**Gastroenterology.** Saturday. 8 hours. $25.

December 12—**Minor Surgery, Office and Hospital.** Saturday. 8 hours. $25.

January 9—**Office Diagnosis and Treatment.** Saturday. 8 hours. $25.

January 23—**Diabetes Mellitus.** Saturday. 8 hours. $25.

For information contact: Arthur Selzer, M.D., chairman, Education Committee, Presbyterian Medical Center, Clay and Webster Streets, San Francisco 94115. WEst 1-8000.

University of California at Los Angeles

October 16-November 6—**Postgraduate Medical Lecture Series in Australia and New Zealand.** Monday-Friday. 32 hours. $200.

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For information on courses for physicians or ancillary personnel contact: Thomas H. Sternberg, M.D., Assistant Dean and Head, Department of Continuing Education in Medicine and Health Sciences, U.C.L.A. Medical Center, Los Angeles 90024, 478-9711, Ext. 2114.

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For course information contact: W. F. Norwood, Ph.D., Assistant Dean and Chairman, Division of Continuing Education, Loma Linda University School of Medicine, 1720 Brooklyn Ave., Los Angeles, California 90033, ANgelus 9-7241, Ext. 214.

University of California, San Francisco

September 8-April 27—**Radiological Physics.** Tuesday evenings. 45 hours. $150.

September 14-16—**Recent Advances in Internal Medicine: Clinics and Demonstrations.** Monday-Wednesday. 17 hours. $60.

September 15-December 8—**Medical Radio Conferences.** Northern California.*†

September 17-December 10—**Medical Radio Conferences.** Northern California.*†

September 18-19—**Minimal Brain Damage in Childhood: Etiology, Evaluation and Treatment.** Friday-Saturday. 12 hours. $35.

September 18-19—**Pediatrics—Cerebral Palsy and Related Disorders.***†

September 18-October 23—**Neuropsychiatric Management in Daily Practice.** Modesto State Hospital. Friday evenings. 12 hours. $10.

September 22-October 27—**Mental Retardation: Problems and Approaches.** Sonoma State Hospital. Tuesday evenings. 12 hours. $10.

September 23-December 16—**Psychotherapeutic Principles and Practice for Non-Psychiatrists.** Langley Porter Neuropsychiatric Institute. Wednesdays. 72 hours. $25.

September 24-October 29 — **Psychosomatic Aspects of Daily Practice.** Napa State Hospital. Thursday evenings. 12 hours. $10.

September 26-27—**Complications: Medical and Surgical Management.** Franklin.*†

September 26-27—**Manifestations and Therapy of Anxiety.** Sacramento. Saturday-Sunday. 8 hours. $7.50.

September 26-27—**Neuropsychiatry for the Non-Psychiatric Physician in General Practice.** Sacramento.*†

September 26-27—**Psychiatric Management in General Medicine.** Mills Hospital, San Mateo. Saturday-Sunday. 10 hours. $10.

September 29-November 3 — **Clinical Considerations in Mental Retardation.** Sonoma.*†

October 3-4—**Psychiatric Management in General Medicine.** San Mateo.*†

October 6-December 8—**Evening Lectures in Medicine.** Oakland Hospital. Tuesday evenings. 16 hours. $35.

October 8-10—**Obstetrical Complications.** Thursday-Saturday. 16 hours. $60.

October 10-11—**Complications: Medical and Surgical Management.** Franklin Hospital. Saturday-Sunday. 12 hours. $15.

*Fee to be announced.
†Hours to be announced.

October 10-11—**Cytology Symposium.***†

October 13-November 24—**Neuropsychiatry in Daily Practice.** Agnews State Hospital. Tuesday evenings. 12 hours. $10.

October 16-17—**Surgery of the Hand and Forearm.** Friday-Saturday. 14 hours. $40.

October 17—**Infectious Diseases in Childhood.** Children's Hospital. Saturday. 6 hours. $15.

October 30-November 1—**Symposium on Mental Retardation for General Practitioners, Non-Psychiatrists and Paramedical Specialists.***†

November 7-8 — **Postgraduate Seminar in Psychiatry.** Fresno Community Hospital. Saturday-Sunday. $10.†

November 7-December 12 — **Postgraduate Seminars in Clinical Sciences.** Mercy Hospital. Saturday mornings. 12 hours.*

November 13-15—**Mental Retardation: Recent Advances and Their Implications for Treatment.** Friday-Sunday. 10 hours. $15.

November 21-22—**Epilepsy: Problems of Diagnosis and Management.***†

November 21-22 — **Problems in Community Mental Health.** Saturday-Sunday.*†

November 22-24—**Neurology.** Sunday-Tuesday.*†

December 2-5—**Retinal Diseases: A Symposium on Differential Diagnostic Problems of Posterior Uveitis.** Wednesday-Saturday. 25 hours. $85.

December 4-5—**Basic Electrocardiography.** Friday-Saturday.*†

December 12-13—**Psychiatric Perspectives in Medicine.** Stockton State Hospital. Saturday-Sunday.*†

Continuously—Courses presented by special arrangement: **Principles and Clinical Uses of Radioisotopes** (full time, one to three months).

For information on courses for physicians or ancillary personnel, contact: Seymour M. Farber, M.D., Assistant Dean, Dept. of Continuing Education in Medicine and Health Sciences, University of California Medical Center, Room 565-U, San Francisco 94122, MOntrose 4-3600, Ext. 179.

University of Southern California

September 12—**Psychiatric Emergencies in Medical Practice.** Mesa Vista Hospital, 7850 Vista Hill Avenue, San Diego. Saturday. 8 hours. $10.

September 15-December 11—**Emergency Management of the Acutely Ill Patient.** Los Angeles County Hospital. Tuesday evenings. 18 hours. $80.

September 16-December 21—**Diagnostic Interviewing of Families.** Los Angeles County Hospital. Wednesday afternoons. 24 hours. $35.

September 16-November 18—**Child Psychiatry—Unit I, The School Age Child.** Los Angeles County Hospital. Wednesday afternoons. 20 hours. $55.

September 16-December 2—**Psychiatric Case Conferences.** Los Angeles County Hospital. Wednesday afternoons. 20 hours. $25.

September 17-May 13—**Supervised Psychotherapy (Sec. 1).** Los Angeles County Hospital. Thursday afternoons. 128 hours. $75.

September 21-October 2—**Intensive Review of Internal Medicine.** Los Angeles County Hospital. Mornings daily. 40 hours. $80.

September 22-May 18—**Supervised Psychotherapy (Sec. 2).** Memorial Hospital of Long Beach. Tuesday afternoons. 128 hours. $75.

September 22-November 24—**Bedside Cardiology.** St. Vincent's Hospital. Tuesday evening. 18 hours. $70.

September 23-December 9—**Elements of Practical Cardiology.** Wednesday evenings. 24 hours. $80.

September 24-December 17—**Bedside Clinics and Set Clinics in Internal Medicine.** Thursday evenings. 24 hours. $80.

September 26—**Psychiatric Emergencies in Medical Practice.** Saturday. 8 hours. $10.

October 18-November 9 — **Medical Centers of South America.** 36 hours. $210.

January 6-March 10—**Psychosomatic Pediatric Case Conferences.** Children's Hospital. Wednesdays 8:00-10:00 p.m. 20 hours. $55.

Continuously—**Basic Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $100. Physicians may register at any time.

Continuously—**Advanced Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $85. Physicians may register at any time.

For course information contact: Phil R. Manning, M.D., Assoc. Dean, Postgraduate Division, USC School of Medicine, 2025 Zonal Ave., Los Angeles 90033, CApital 5-1511, Ext. 300.

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The Physician's BOOKSHELF



THE PSYCHOLOGICAL ASPECTS OF DIABETES Or How To Live In Emotional Balance With Diabetes— Harold Geist, Ph.D., Consulting Psychologist, Berkeley, Calif.; with a foreword by Mary B. Olney, M.D., Executive Director, Bearskin Meadow Diabetic Camp. Charles C. Thomas, Publisher, 301-327 East Lawrence Avenue, Springfield, Ill., 1964. 81 pages, $4.75.

This small monograph written by a consulting psychologist is intended to provide "... psychological information for the assistance of all those involved with the disorder." It is also aimed at the patient since it contains "suggestions for helping the patient in overcoming emotional problems." The language of the book is nonmedical and should be understandable by well educated lay people, at least those who are well oriented in modern psychological terminology. Presentation of the psychological problems of the patient with diabetes is well done and there are many helpful suggestions for dealing with the patients having these problems. Suitable emphasis is placed on the frequency of aberrant behavior resulting from the life-long adjustment facing the patient with diabetes.

The introductory chapter dealing with the physiological and medical aspects of diabetes is superficial and in fact several erroneous statements are included. For instance, the statement is made "Since the muscles live in sugar, exercise helps them utilize it." Modern research has revealed that muscles live chiefly on fat. The point the author is making that exercise is helpful and important and generally increases utilization of sugar is true. Another concept long ago disproved that "diabetes tends to occur at a younger age in each generation" should not appear in a book published in 1964. It might have been better had the author omitted physiological and medical information about which he may not be qualified to write.

The last section entitled Miscellaneous Problems also contains several statements which would be challenged by many experts. For instance it is said that "... of the middle-aged diabetics, about 25 per cent require insulin treatment and the rest can be managed with the oral medications." Another statement which would be widely disputed is "... with well-controlled diabetic women without complications, the loss is only about 6 per cent"—this referring to the fetal loss in diabetic pregnancies from the sixth month to the second day after birth. In fact the lowest fetal loss is in the range of 10-15 per cent and this may be as high as 35-40 per cent. The statement in regard to fat atrophy that "atrophy and hypertrophy are minimized by ... not refrigerating the insulin" has certainly not gained very wide acceptance.

In discussing future research mention is made of only one of the three presently available sulfonylureas and this by the trade name. The discussion of research is superficial and parochial.

In conclusion the main purpose of the book to give an orientation to psychological problems of the diabetic is well presented. The book contains so much misinformation and superficial discussions of modern physiology and pathology related to diabetes that this reviewer is not sure how it weighs in the balance.

JOSIAH BROWN, M.D.

LEUKEMIA—Second Edition, Revised and Enlarged— William Dameshek, M.D., Professor of Medicine, Tufts University School of Medicine; Senior Physician and Director, Blood Research Laboratory, New England Center Hospital, Boston; and Frederick Gunz, M.D., Ph.D., Hematologist, North Canterbury Hospital Board; Director, Cytogenetics Unit, Christchurch Hospital, Christchurch, New Zealand; Late Research Fellow in Hematology, New England Center Hospital, Boston. Grune & Stratton, Inc., New York and London, 1964. 594 pages, $25.00.

This new edition is in general similar to the 1958 edition, updated with a thousand new references, chiefly before 1962. The basic knowledge of the disease is reviewed and recent findings and concepts are introduced, e.g. chromosomal abnormalities, thymus-lymphocyte relationships. There are lengthy sections on the clinical aspects and treatment, and a few pages on What to Tell the Patient which should be read by all who treat individuals with this disease.

This is probably the best book available on the subject, based on the extensive experience of the authors, flavored with some of their own ideas such as "immunocyte," "lymphoproliferative disease," etc.

The index is inadequate; Downs' syndrome and Burkitt "lymphoma" mentioned in the Preface are not to be found. This is primarily a reference volume; the defect in the index will offer some difficulty.

The black and white illustrations and diagrams are for the most part excellent. The color plates, on the other hand, add little more than cost to the volume, almost out of reach for the hematologist, internist, pathologist and investigator for whom it is intended.

WILLIAM F. LUTTGENS, M.D.

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MODERN TREATMENT—Volume 1, Number 1, January 1964. Treatment of Renal Disease, by E. Lovell Becker, M.D., Guest Editor; **Treatment of Thyroid Disease,** by Edward A. Carr, Jr., M.D., Guest Editor. Harper & Row, Publishers (Hoeber Medical Division), New York, 1964. Bimonthly publication, by subscription only; 6 books a year; $16.00 per year (laminated paperback); 228 pages.

This is the first issue of a bimonthly publication whose stated purpose is that "it will provide, for the first time, on a continuing basis, the detailed information the physician needs to make the wisest decisions on treatment once he has reached a firm diagnosis." It is planned to have each issue deal with one or two areas of clinical interest.

This first number presents two series of articles dealing at equal length with renal disease and with thyroid disease. The contributors are distinguished physicians from a number of medical centers in the East, South and Midwest. Each covers an assigned field to the end that there is a minimum of overlapping. The approach to the discussions of therapy is physiologic with each of the authors presenting enough of the rationale for the procedures recommended to keep the reader from feeling that he is being given arbitrary dicta.

Not all the authors confine themselves to discussion of treatment. For example, Dr. George E. Schreiner whose contributions in the field of renal disease are widely recognized and appreciated has written an article of eighteen pages on chronic renal failure, five and half of which consist of a table

classifying renal diseases by etiology. Again, an article on hypothyroidism during infancy and childhood contains fourteen pages of text including a summary, plus one full page illustration and a page and a half of references: therapy is presented in a section extending over but one and a half pages, and in 4 sentences in the summary.

An article on the management of acute pyelonephritis is concise and clear. In the discussion of antibacterial agents no mention is made of nalidixic acid (NegGram®) while the importance of urinary pH is referred to in but a single sentence and then only in relation to the use of sulfonamides. There is no contribution on the treatment of chronic pyelonephritis or on urinary lithiasis. Contributions on these topics would have seemed to be more useful to the practitioner than did an article on the pharmacology of organic mercurial and diuretic compounds.

As might be expected the opinions offered, while authoritative, are sometimes at variance with those of others in the field. For example, Dr. DeGroot of Boston in discussing the treatment of the single toxic nodule of the thyroid, refers to resection of the nodule as customary, but seems to favor the use of I^{131}. Others would argue strongly for subtotal resection of the gland. It is entirely proper and desirable for the authors to express their preferences, but fuller consideration of problems in therapy may often be obtained by reference to larger works such as, for example, those written by Dr. DeGroot and his colleagues at the Massachusetts General Hospital, and by Dr. Schreiner.

In summary, the reviewer found the articles in this first number easy to read, enjoyable, and authoritative. The information offered has been presented elsewhere in standard works and journals, but has been here distilled into essays which are lucid and helpful to all interested in the areas covered.

ADOLPH SURTSHIN, M.D.

* * *

PEDIATRIC OPHTHALMOLOGY—edited by L. Byerly Holt, M.D., F.I.C.S., Surgical Director, Marguerite Barr Moon Eye Research Foundation, Inc., Winston-Salem, North Carolina. Lea & Febiger, Philadelphia, Pa., 1964. 403 pages, $12.00.

This book will be of value for pediatricians with particular interests in ophthalmology, or with problems relating to specific eye defects in their patients. It will be helpful to residents in pediatrics and in ophthalmology for orientation. Most sections of the book are written with a direction toward the pediatrician as a reader, and will not fully explore individual subjects to the extent desired by an interested ophthalmologist. Representing as it does a compendium including contributions by 32 separate authors, it has several brilliant sections (cataract, ocular tumors, strabismus, myopia, neurology). I was surprised that a section on retrolental fibroplasia was not included, as this important disease is still with us. In summary, the book has value for pediatricians as a reference, and for residents, students and interns as a source of introductory information.

ALAN B. SCOTT, M.D.

* * *

SPECIALTIES IN GENERAL PRACTICE—Third Edition—edited by Russell L. Cecil, M.D., Professor of Clinical Medicine, Emeritus, Cornell University Medical College, New York City, and Howard F. Conn, M.D., Staff, Uniontown Hospital, Uniontown, Pennsylvania. W. B. Saunders Company, Philadelphia and London, 1964. 676 pages, $17.50.

This book proposes to be a reference handbook for general practitioners and within the limitation imposed on the authors it accomplishes this. To cover the field of surgery in sixty two pages or pediatrics in sixty pages is indeed quite a challenge and it is remarkable that the authors have done so well. There are some who would appreciate the absence of what they call useless discussion and there are others who would prefer, when reaching for a reference book, to have a full discussion of the problem they are reviewing.

The book could be very useful to other physicians, any of the specialists, who want a quick refresher of their memories when they run across something outside of their field and yet want to discuss briefly and intelligently their discovery with the patient and with the physician to whom they will do the referring.

As would be expected the chapters are not uniform in their approach. For example, the chapter on surgery assumes that the reader will have had a good medical education and proposes the latest opinions on diagnosis and therapy while the section on ophthalmology starts out with instruction on the use of the ophthalmoscope which everyone should have learned long ago in medical school.

Where space, weight and time are the important factors in a reference book this one will be found quite satisfactory. Where thoroughness of discussion is desired one should turn to more extensive treatises. This latest edition seems to have been thoroughly revised and brought up to date.

STANLEY R. TRUMAN, M.D.

* * *

CURRENT PSYCHIATRIC THERAPIES—An Annual Publication—Vol. IV, 1964—edited by Jules Masserman, M.D., Professor and Co-chairman of Psychiatry, Northwestern University, Chicago, Illinois. Grune & Stratton, Inc., 381 Park Avenue South, New York, N.Y., 1964. 315 pages, $9.75.

This is not (and is presumably not intended to be) a comprehensive review or a digest of current psychiatric therapies. It consists of 38 articles by 56 contributors of varying quality and content; ranging in style from reviews and anecdotes to more precise research investigations; but concentrating particularly on the rationale and technics of family, group and community therapy. Depending on his interests and prejudices, the psychiatrist or the psychiatrically minded reader will find some articles stimulating, others mediocre.

In this book, the very last section of all is headed "Psychiatry Abroad," its professional content being devoted mainly to the Mental Health Service in Britain. To set the record straight, "therapeutic community" methods were developed in Britain *before* the Mental Health Service, and current psychiatric therapy in the U.S. owes much to the pioneer work of men such as Cerletti and Bini, Denniker, Freud, Main, Jones, Simmel and Sivadon. It is hoped that future volumes in this series will include this perspective.

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TEXTBOOK OF OTOLARYNGOLOGY—Second Edition—David D. DeWeese, M.D., Professor and Chairman of the Department of Otolaryngology, University of Oregon Medical School, Portland, Ore., and William H. Saunders, M.D., Professor and Chairman of the Department of Otolaryngology, The Ohio State University College of Medicine, Columbus, Ohio. The C. V. Mosby Company, St. Louis, 1964. 523 pages, $9.25.

This is probably the best textbook on otolaryngology presently available. The outstanding characteristic of its first edition, *clarity*, is continued in this second edition.

It is particularly good for the medical student, and the general physician interested in otolaryngology. But its comprehensive picture of the broad field of otolaryngology, and as a ready source of references, makes it also of value to the practicing specialist.

No drastic changes from the first edition are made in this second edition. It is slightly larger (523 pages as against 464); additional pertinent illustrations account for many of these pages. The excellence of the first edition precluded radical changes.

The material is presented clearly and is factually accurate. This superb text is obviously written by practical, experienced specialists, who have treated patients, striving to give them the best treatment. The many little details indicate the authors are excellent teachers, actively engaged in teaching.

The non-otolaryngologist-physician who wishes to understand modern otolaryngology better will find this an excellent bible.

This is a good book.

WALTER E. HECK, M.D.

* * *

ALCOHOL AND CIVILIZATION—edited by Salvatore Pablo Lucia, M.D., Sc.D., Professor of Medicine and Preventive Medicine; Chairman of the Department of Preventive Medicine; Lecturer in Medical History and Bibliography; Consulting Physician in Oncology; University of California School of Medicine, San Francisco, California; McGraw-Hill Book Company, Inc., New York, San Francisco, Toronto, London, 1963. 416 pages, $3.95. (McGraw-Hill Paperbacks)

When I first received this volume for review, after many years of interest in the problem of alcohol, I must admit that I initially expected it to be "old hat." However, a quick perusal of the list of contributors assuaged some of my apprehension and subsequent careful review of its contents revealed a fascinating assemblage of data which I would strongly recommend to interested readers, whether they be "pro" or "con" on the question of alcohol use.

I further questioned the motivation behind its production when I noted, in the preface, the sponsorship of the Wine Advisory Board of the State Department of Agriculture which could have a vested interest in alcohol consumption. Erudition was presaged, however, in the Introduction by John B. de C. M. Saunders, M.D., Provost of University of California Medical Center and Dean of the School of Medicine. Indeed erudition is not lacking in the excellent papers. Chauncey Leake's expository includes a stimulating survey of much of the pre-current history of medicine. The late Franz Alexander's discussion of behavioral disorders, with perspective on alcohol use and misuse, is expectedly perceptive.

The laboratory and theoretical studies, as presented by Masserman, Greenberg and Drew, refresh one's mind on the scientific approach to problem-solving studies.

The sociologic aspects and the "set" of cultural patterns are reviewed by Lucia, Rouesche, Lolli, and Strauss, while Judge Murtagh adds some interesting legal insights.

Dr. Bruun of Finland summarizes four social truisms which have application in this field as in others:

"1. Every social system has certain needs for the maintenance of the system.

2. Every social custom is functional in the sense that it fulfills some of the needs of the social system.

3. A social need may be fulfilled by different social customs; or, to put it in another way, different social customs may serve the same social function in different social systems or at different times within a given social system. The social customs which satisfy the same social need are called functional alternatives.

4. Social customs hang together to make up a meaningful whole, so that a change in one social custom entails changes in one or more of the other customs."

These principles seem quite pertinent as we look back on our various experimental approaches to cure the evils of alcohol misuse by drastic social reforms.

Another anachronism in our approach to the question is our tendency to bypass all of the early patterns which later lead to problems and instead focus our attention and our concern on the woes of the "skid-row" character. What we teach children and the example we set them, as well as our success in teaching them that reality is tolerable, may do much more to protect them from the improper use of alcohol than will a great deal of wailing about the terrors of alcoholism.

It was interesting to note that practically all of the essayists evaded a firm definition of the "alcoholic," except during the panel discussions when someone referred back to Marty Mann's definition that alcoholism is present "when a drinking problem is sufficient to interfere continually with any major area of one's life."

The antiquity of the use of alcohol was brought out by Mr. Rouesche with indications that it was present in Paleolithic and Neolithic cultures. Prior to "civilization" its use was essentially ritualistic and in group occasions. Civilization brought the "casual," individual drinker whose isolated excesses impinged on the mores of the community.

Dr. Lolli pointed out that his years of concern with the problem had brought him to the viewpoint of "the extreme center" and he felt that our primary concern, up and down the line is with the problem of inebriety, not primarily with alcoholism for "without inebriety there is no alcoholism." Inebriety he defines as "alcohol-induced inefficiency" and points out that we classify people as "alcoholics" when "they become inebriated inappropriately, frequently, and intensely."

Lolli goes on to point out that "in the so-called well-adjusted individual, inefficiency occurs at the proper time and with the proper intensity to meet the demands of efficiency at a later time." In applying this idea to a given case he asks two questions: "(1) Does ethyl alcohol contribute favorably or unfavorably to an individual's efficiency when he needs efficiency" (2) Does ethyl alcohol contribute favorably or unfavorably to an individual's inefficiency when he needs inefficiency in order to foster greater efficiency to come?"

The title of the volume might well have been "Civilized Drinking." To those who do or don't aspire to this objective the book is an excellent reference source as well as pleasurable reading.

STUART C. KNOX, M.D.

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TUMORS OF INFANCY AND CHILDHOOD—Paul Michael, M.D., Associate Clinical Professor of Pathology, University of California Medical Center, San Francisco; Pathologist, Monterey Hospital, Monterey; Consultant Pathologist to Children's Hospital of the East Bay, Oakland, California; Consultant Pathologist to Highland-Alameda County Hospital; Booth Memorial Hospital, Oakland. J. B. Lippincott Company, Philadelphia and Montreal, 1964. 461 pages, $18.50.

This book makes some mention of nearly every type of human neoplasm, matching the detail of presentation with the importance of each tumor type in childhood. One chapter deals with lipid storage diseases under the designation of pseudotumors. The presentation is conventional, with the principal emphasis upon the classification of tumors. Histological aspects of the different tumors constitute a major part of the book, though for each variety there is usually a note concerning the gross appearance, another outlining the clinical picture, and a paragraph on prognosis and treatment. Illustrations are abundant. The more than 300 large figures deal principally with histological tumor patterns. For the most part they depict classic features of the more important tumors, and for this purpose they are well chosen. At the end of each of fifteen chapters is a generous bibliography classified as to specific tumor types. Nearly all of the cited papers are in English.

The book describes more tumors than are included in any textbook of pediatric pathology; indeed it can serve as a complete compendium of neoplasms of childhood. Of particular value are its illustrations of the histological features of many tumor types.

ALVIN J. COX, M.D.

NECK AND ARM PAIN—Rene Cailliet, M.D., Chief of Department of Physical Medicine, Southern California Permanente Medical Group; Associate Clinical Professor, University of Southern California School of Medicine, Department of Physical Medicine and Rehabilitation; Department Head, Physical Medicine, Kaiser Foundation Hospital, Southern California. F. A. Davis Company, Philadelphia, Pa., 1964. 112 pages, $3.00 (paperback).

This 6 x 9 inch pocketsized paperback presents in an uncommonly lucid style (enhanced by 72 illustrations) the controversial beclouded subject of neck and arm pain. The functional anatomy of the cervical spine, both stationary and moving, the ranges and directions of motions in the various joints, the relationships of nerve roots and other soft tissues in varying anatomical positions and how trauma, degeneration, and inflammation might alter these relationships with production of symptoms, are clearly described and illustrated. There are chapters on cervical disc disease, among them an exceptional, completely objective one on the so-called "whip-lash" syndrome, diagnosis and treatment.

The book brings together in a small volume (112 pages) all that is now known pertinent to the subject (75 references mentioned). This reviewer considers it a great bargain ($3.00). Orthopedic residents, orthopedic surgeons, surgeons treating trauma, rheumatologists, physiotherapists and all interested in physical medicine and rehabilitation will enjoy reading and having this book handy for reference.

Don King, M.D.

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PROBLEMS OF THE BIOCHEMISTRY OF THE NERVOUS SYSTEM—edited by Professor A.V. Palladin, Member of the Academy of Sciences of the U.S.S.R. and the Academy of Sciences of the Ukrainian S.S.R. Translated by F. S. Freisinger. Translation edited by H. Hillman and R. Woodman, Institute of Psychiatry, London. A Pergamon Press Book, distributed by The Macmillan Company, New York, pursuant to a special arrangement with Pergamon Press Limited, Oxford, England, 1964. 330 pages, $11.50.

This book is the proceedings of a symposium held in 1957, plus an article by Prof. Palladin, "The Functional Biochemistry of the Brain." Like similar volumes from western countries, the contributed papers vary tremendously in content and quality. The title word "Problems" is intended to convey that this is not a comprehensive text, but a selected sampling of work in progress by a variety of laboratories. As such it is of little interest to anyone not engaged in such research himself. Even Prof. Palladin's summary article deals only with a limited number of topics. Two impressions stand out after a rapid perusal: (1) the Soviet biochemists are using the most sophisticated tools with facility—histochemistry, electrophoresis, and radio-active tracers, (2) there is much less emphasis of Pavlovian physiological theory than one would expect and a large number of papers deal with subjects of clinical interest—ammonia metabolism in brain, hypothermia, radiation, injury and infection. Separate sections are devoted to protein, phosphate, carbohydrate and adrenaline metabolism. The translation is excellent.

J. E. Holmes, M.D.

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AN ESSAY ON COLOR VISION AND CLINICAL COLOR-VISION TESTS—Arthur Linksz, M.D., F.A.C.S., Clinical Professor of Ophthalmology, New York University Post-Graduate Medical School, New York, New York, and Attending Surgeon, Manhattan Eye, Ear and Throat Hospital, New York, New York. Grune & Stratton, Inc., New York and London 1964. 254 pages, $15.75.

This essay on color vision is excellently printed on glossy paper with a number of fine illustrations. It is not for the average ophthalmologist's office but belongs in any medical center's library as a reference text.

COMMUNICABLE AND INFECTIOUS DISEASES—Diagnosis, Prevention, Treatment—Fifth Edition—Franklin H. Top, A.B., M.D., M.P.H., F.A.C.P., F.A.A.P., F.A.P.H.A. Professor and Head, Department of Hygiene and Preventive Medicine, State University of Iowa, Iowa City, Iowa; Director, University Department of Health, and Director, Institute of Agricultural Medicine, State University of Iowa. The C. V. Mosby Company, St. Louis, Mo., 1964. 902 pages, $21.00.

What, in its first edition in 1941, was a modest-sized text of a few hundred pages has now grown through five editions into a textbook of almost a thousand pages. It remains a thorough, authoritative and up-to-date text on every communicable or infectious disease which one is likely to encounter in this country. It is a text to which most pediatricians, general practitioners and internists will want to have access or own. Particularly satisfactory is the list of references to key articles at the end of each of its 63 chapters.

This fifth edition follows the fourth by four years and reflects the rapid changes in the use of antibiotic and chemotherapeutic agents and the newer knowledge acquired in acute respiratory infections, primary atypical pneumonia and the enterovirus infections. There are seven new contributors.

William C. Deamer, M.D.

* * *

DISEASES OF THE HEART AND BLOOD VESSELS—Nomenclature and Criterai for Diagnosis—Sixth Edition—The Criteria Committee of the New York Heart Association: Charles E. Kossman, M.D., Chairman; Herbert Chasis, M.D.; Charles A. R. Connor, M.D.; Clarence E. De La Chappelle, M.D.; William T. Foley, M.D.; Rejane M. Harvey, M.D.; Edwin P. Maynard, Jr., M.D.; and John B. Schwedel, M.D. Medical Book Dept., Little, Brown and Company, Boston 6, 1964. 463 pages, $5.50.

Ten years have passed since this classic in cardiology has been revised. The "Criteria for diagnosis of diseases of the heart" has been accepted in all parts of the world as the authoritative reference for cardiovascular diagnosis. The new sixth edition, revised, rewritten, and completely updated, is a superb continuation of the tradition begun with the first edition in 1928. The Criteria Committee of the New York Heart Association, chaired by Dr. Kossman with a number of subcommittees of outstanding professional qualifications, is to be complimented on this work.

The authors have rearranged the material and have developed a new numerical system by which the chapters and paragraphs are numbered so that cross references can be easily found. The book is divided into five parts—the nomenclature and criteria for cardiac diagnosis, for vascular diagnosis, for pathologic diagnosis, for roentgenologic diagnosis, and for electrocardiographic diagnosis. In each section, the symptoms, signs and criteria are clear, succinct, and reflect the essence of the diagnosis. The illustrations are extremely well done, selected with a critical eye, and add to the book.

The chapter on physical capacity with heart disease is lucidly written and clearly states the functional and therapeutic classifications of patients with heart disease. The emphasis on classifying each patient with heart disease in terms of etiology, physiology, anatomy, and functional and therapeutic characteristics has been a hallmark of the book and is maintained in this edition.

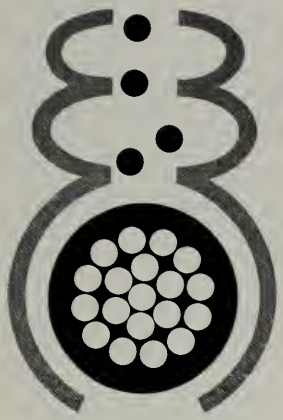
Two suggestions for the committee to consider for the next edition would be:

(1) a categories code sheet to place the various criteria on tape for future analysis, and

(2) a selected bibliography.

All physicians will be grateful to the New York Heart Association for the continued excellence of this valuable book.

Maurice Sokolow, M.D.



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Pending discovery of the cause, early cessation of diarrhea is almost always urgently indicated. Prompt symptomatic control averts distress, dehydration and, frequently, severe exhaustion.

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The recommended initial *adult* dosage is two tablets (2.5 mg. each) three or four times daily, reduced to meet the requirements of each patient as soon as the diarrhea is controlled. Maintenance dosage may be as low as two tablets daily. *Children's* daily dosage (in divided doses) varies from 3 mg. for a child of 3 to 6 months, to 10 mg. for one 8 to 12 years of age.

cautions and side effects:

Lomotil is an exempt narcotic; its abuse liability is low and comparable to that of codeine. Recommended dosages should not be exceeded. Side effects are relatively uncommon but among those reported are gastrointestinal irritation, sedation, dizziness, cutaneous manifestations, restlessness and insomnia. Lomotil should be used with caution in patients with impaired liver function and in patients taking addicting drugs or barbiturates.

Lomotil is a brand of diphenoxylate hydrochloride with atropine sulfate; the subtherapeutic amount of atropine is added to discourage deliberate overdosage.

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Research in the Service of Medicine

John D. Archer, M.D., to Join AMA Drug Department

John D. Archer, M.D., a clinician-pharmacologist formerly associated with the Food and Drug Administration's Division of New Drugs, will join the American Medical Association Department of Drugs on August 15.

He will serve as assistant director of the Drug Evaluation Section, which bears responsibility for preparing authoritative, unbiased statements on drug therapy.

In collaboration with expert consultants who evaluate all available published and unpublished data relating to the actions, usefulness, dosage and safety of commercially available drugs, official statements are developed by the section for approval and publication by the AMA Council on Drugs. The statements are published in the Journal of the AMA and in New and Nonofficial Drugs, the annual volume to be known in the future as New Drugs.

Dr. Archer's experience fits him uniquely for his new position, noted Dr. Jean Weston, director of the Department of Drugs.

While with the Food and Drug Administration from 1957 through most of 1962, Dr. Archer's primary concern was the evaluation of research and other information relating to the safety and usefulness of drugs. He rose from the position of medical officer to that of acting director of his division.

During five previous years with the Department of Pharmacology and Toxicology, University of Texas, Galveston, he conducted research in clinical pharmacology, animal pharmacology, and held teaching appointments which included an assistant professorship.

His most recent position was that of staff physician at the Veterans Administration Center, Temple, Tex.

Dr. Archer is 41, married, and the father of two children.

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Some Overcome One Disease Just to Develop Another

Some persons seem to be able to develop a new disease as fast as an old one disappears.

The phenomenon, termed "syndrome shift," was described by Dr. J. J. Groen, Jerusalem, Israel, in the July *Archives of Internal Medicine*, published by the American Medical Association.

It is not a rare occurrence, he explained, and sometimes patients show more than one shift or shift back into the original disease.

Syndrome shift is seen mostly in patients with disorders involving the central nervous system whether it is a typical mental disease or a psychosomatic disorder, he said. It is rare in patients with infectious diseases or tumors, he added.

It is striking how often the shift is from a psychic to a somatic syndrome or vice versa, Dr. Groen commented.

Although a shift may occur without apparent reason, the switch often takes place after some form of medical treatment which, without eradicating the cause of the disease, interferes with its natural course, he continued. In several cases, he said, it seemed as if a therapeutic effort, meant to improve the patient, only brought about a shift in symptoms, which was not always a change for the better. When the treatment was stopped, he added, the patient shifted back into the original ailment.

In other cases, he pointed out, a change of circumstances under which the patient lived seemed to produce the shift. As an example, he cited a psychopathic burglar who had been sentenced more than 20 times for house breaking when a well-meaning judge ordered him confined to a mental hospital. The patient appeared responsive to the change in environment, including group and occupational activities, so that when he was released and encountered difficulty in finding an "honest job," he did not return to burglary. However, he developed a duodenal ulcer.

Dr. Groen suggested that syndrome shift is a manifestation of the fundamental capacity of the central nervous system to substitute one reaction pattern for another one under changing circumstances.



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Useful for control of
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—psychic tension mixed with
depressive symptoms
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intensified by somatic complaints

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Indications: Valium (diazepam) is of use in dealing with anxiety reactions stemming from stressful circumstances or whenever somatic complaints are concomitants of emotional factors. It is useful in psychoneurotic states manifested by anxiety, tension, fear and fatigue. Valium (diazepam) may also be useful in acute agitation due to alcohol withdrawal. Valium (diazepam) may be of use to alleviate muscle spasm associated with cerebral palsy and athetosis.

Dosage and administration	*Usual daily dose*
Mild to moderate psychoneurotic reactions: Manifested by anxiety-tension alone or with depressive symptomatology, agitation, restlessness, psychophysiological disturbances	2 mg to 5 mg, 2 or 3 times daily
Severe psychoneurotic reactions: Where severe anxiety, fear, agitation, aggression or hostility exist alone or with depressive symptoms	5 mg to 10 mg, 3 or 4 times daily
Alcoholism: As an aid in symptomatic relief of acute agitation, tremor, impending or acute delirium tremens and hallucinosis	10 mg, 3 or 4 times during the first 24 hours; reducing to 5 mg, 3 or 4 times daily as needed
Muscle spasm associated with cerebral palsy or athetosis	2 mg to 10 mg, 3 or 4 times daily

Contraindications: Valium (diazepam) is contraindicated in infants, patients with a history of convulsive disorders or patients with a history of glaucoma.

Warning: Valium (diazepam) is not of value in dealing with psychotic patients manifesting anxiety and should be avoided when there is reason to believe the patient is psychotic.

Precautions: In elderly or debilitated patients, it is important to limit the dosage to the smallest effective amount to preclude the development of ataxia or oversedation (not more than 1 mg, 1 or 2 times daily initially, to be increased gradually as needed and tolerated). As is true of all CNS-acting drugs, until the correct maintenance dosage is established, patients receiving Valium (diazepam) should be advised against possibly hazardous procedures requiring complete mental alertness or physical coordination. Driving an automobile during the period of Valium (diazepam) therapy is not recommended. In general, the concurrent administration of Valium (diazepam) and other psychotropic agents is not recommended. If such combination therapy is used, careful consideration should be given to the pharmacology of the agents to be employed with Valium (diazepam)—particularly with known compounds which may potentiate the action of Valium (diazepam), such as phenothiazines, barbiturates, MAO inhibitors and other antidepressants.

Since Valium (diazepam) has a central nervous system depressant effect, patients should be advised against the simultaneous ingestion of alcohol and other central nervous system depressant drugs during Valium (diazepam) therapy. Safe use of Valium (diazepam) during pregnancy has not been established. The usual precautions are indicated when Valium (diazepam) is used in the treatment of anxiety states where there is any evidence of impending depression; particularly the recognition that suicidal tendencies may be present and protective measures may be necessary. The usual precautions in treating patients with impaired renal or hepatic function should be observed.

Side effects: In clinical use, fatigue, drowsiness and ataxia have been reported; in most instances these are dose-related and may be avoided by proper dosage adjustment. Mild nausea and dizziness may occur on occasion. As with any new agent, when it is administered for protracted periods of time, periodic blood counts and liver function tests are advisable. Abrupt cessation after prolonged overdosage may, in some patients, produce withdrawal symptoms (*e.g.*, convulsions, tremor, abdominal and muscle cramps, vomiting, sweating) similar to those seen with barbiturates, meprobamate and Librium® (chlordiazepoxide HCl). Changes in EEG patterns have been observed in patients during and after Valium (diazepam) treatment.

Paradoxical reactions, such as excitement, depression, stimulation, sleep disturbances, acute hyperexcited states and hallucinations have been reported. Other side effects noted have been blurred vision, diplopia, headache, incontinence, slurred speech, tremor and skin rash.

Valium (diazepam) is available as 5 mg and 2 mg tablets. For convenience and economy in prescribing, both strengths are supplied in bottles of 50.

Roche Laboratories endorses the principle of caution in the administration of any therapeutic agent to pregnant patients.

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How to Live to Be 100

There are about as many theories on how to live to be 100 as there are people who have reached the century mark, according to an article in the June *Today's Health* magazine, published by the American Medical Association.

Most centenarians could probably agree on the life-preserving values of the right foods, sufficient rest, and moderation, the article said. But when it comes to the use of alcohol and tobacco, anyone sifting through the advice of the oldsters finds a split right down the middle.

For example, 105-year-old George Kent of Thurvaston, England, attributed his life span to his daily custom of a pint of beer and pipesmoking, but a retired barber of the same age, Charles Decker of Marcellus, Mich., credited his longevity to the fact that he neither drank nor smoked.

Bernardo Ramirez Hernandez, the Mexican who died in 1963 at the reputed age of 133, always maintained that he had never been ill and had drunk tequila every day.

A more scientific opinion has been offered by Dr. Robert J. Samp of the University of Wisconsin on the basis of a survey of 29,000 Americans who made it to the age of 100. Dr. Samp concluded that "all of them seemed to have adopted the policy of 'Why fight? Why not roll with the punch?'"

In addition to moderation, he said, a person's future life and length depends on such things as competing with the Joneses and the boss, and on environment and heredity.

The article was written by Sheldon Mix.

Two-Year-Old Boys Top Accident Statistics

Two-year-old boys run a very high risk of being injured accidentally.

In a year-long study of 9,206 suburban children under the age of 7, the highest accident rate was among two-year-old boys (229 per 1,000) being 75 per cent greater than in any other age-sex category.

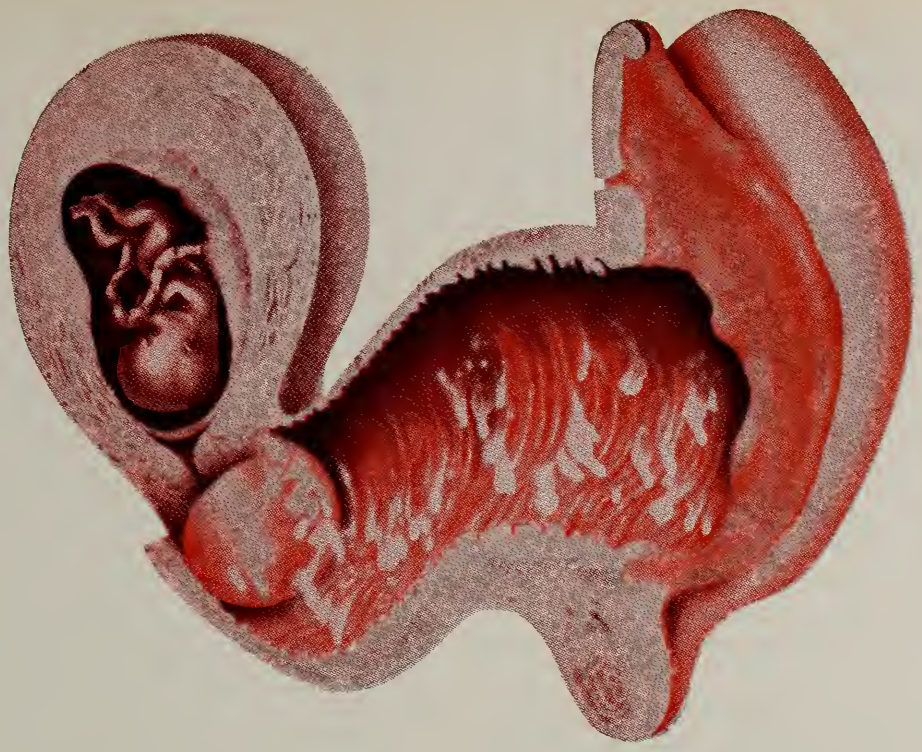
The study, conducted in Rockland County, 30 miles north of New York City, was reported by Donald G. Dickson, M.D., Edward R. Schlesinger, M.D., Janice R. Westaby, M.P.H., and Lisel Lowen, M.P.H., New York City, in the June *American Journal of Diseases of Children*, published by the American Medical Association.

Boys had higher accidental injury rates than girls at all ages, except under 1 year, the study showed.

Falls were the cause of 48 per cent of the total number of accidental injuries.

About 55 per cent of the accidents took place out of doors with the yard far outranking all other sites. About 45 per cent of the accidents occurred indoors. The kitchen was the most frequent site with the bedroom a close second.





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*Bernstine, J. B., and Rakoff, A. E.: Vaginal Infections, Infestations and Discharges, New York, The Blakiston Company, Inc., 1953.

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Cold Probe Used For Surgical Destruction Of Pituitary Tissue in 19

A freezing technique has been used for the surgical destruction of pituitary tissue in 19 patients suffering various disorders, it was reported in the July 27 *Journal of the American Medical Association.*

Use of the cold probe was described by Drs. Robert W. Rand, Alfred M. Dashe, Donald E. Paglia, Louis W. Conway and David H. Solomon, Los Angeles.

A small vacuum-type tube, cooled to a temperature of from –170 to –184 degrees centigrade by a liquid-nitrogen system, is inserted through the side of the head into the desired region of the pituitary gland, the authors explained. The temperature is reduced slowly to the minimum level and maintained for 10 to 15 minutes. During the procedure, the function of nerves which might be affected are tested every few seconds.

A surgical technique which can be performed with a minimum of risk is needed to treat patients with conditions requiring destruction of all or part of the pituitary gland, according to the physicians. Currently employed techniques have certain drawbacks and complications, they said.

Serious complications were not encountered with the cold probe technique in their series, the physicians reported.

Of the 19 patients, 13 had disseminated breast cancer. The response of these patients "seems at this early date to be comparable to other modes of pituitary ablation, but accurate statistical evaluation must await a larger group of patients," the authors pointed out.

Of particular interest, they said, was the improvement following the procedure in one patient with acromegaly, a disease caused by overfunction of the pituitary which is characterized by enlargement of the bones and soft parts of the hands, feet and face. In six weeks, they said, there was marked reduction of the patient's headaches and swelling as well as striking improvement of her facial appearance.

No conclusions could be drawn concerning the results of the procedure in the remaining patients, four of whom had diabetic retinopathy, an eye condition which can be alleviated by pituitary destruction, and one with Cushing's disease, a syndrome resulting from overgrowth of certain pituitary cells.

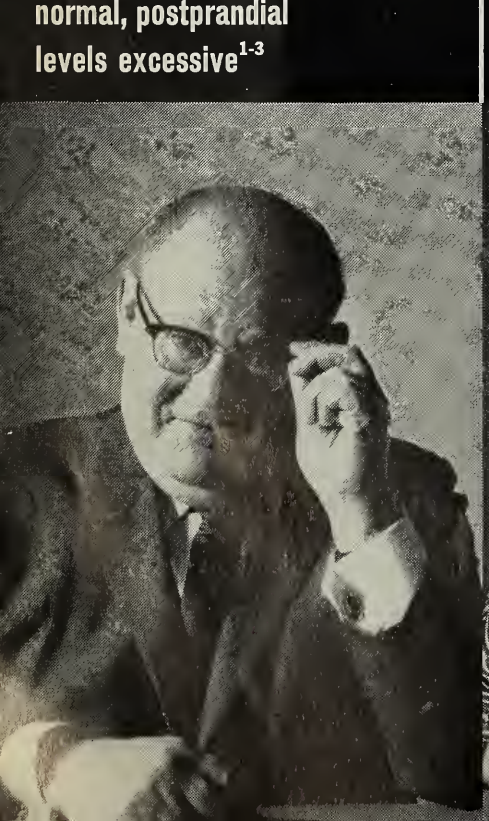
The five physicians were affiliated with the departments of surgery, medicine and pathology, University of California, Los Angeles, School of Medicine, at the time of the study. Dr. Conway is now at Medical College of Virginia, Richmond.

in the overweight stable adult

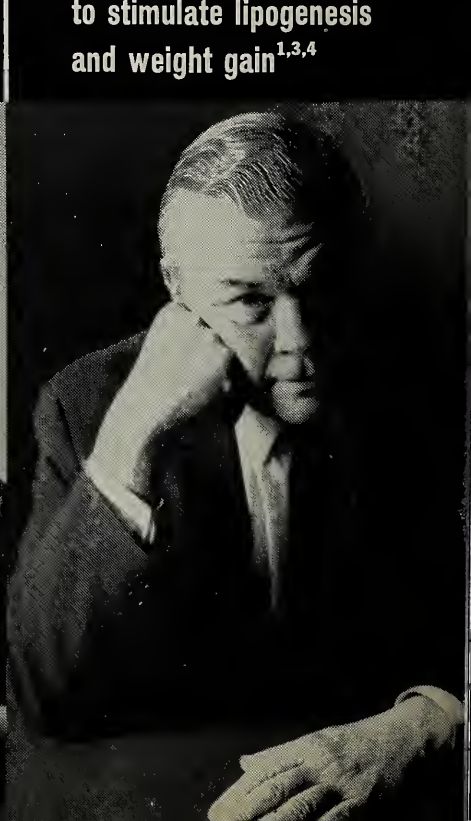
...fasting serum levels of insulin are usually normal, postprandial levels excessive[1-3]

...insulin acts in adipose tissue via hexose monophosphate shunt, principal path of glucose conversion to storage fat[1,4]

...excessive endogenous insulin acts to stimulate lipogenesis and weight gain[1,3,4]







REFERENCES AND REVIEWS

A Free Radical Mechanism for Solvent Toxicity—Z. T. Wirtschafter (VA Hosp., Portland, Ore.) and M. W. Cronyn, Arch. Environ. Health, 9:186 (Aug.) 1964.

A free radical mechanism is proposed for the initial mode of the reaction of hydrocarbons and halogenated hydrocarbons in the biological organism. This hypothesis is suggested by the metabolic products, relative toxicities, and chemical characteristics of these substances. Chain transfer constants are suggested as more appropriate indices of potential radical reactivity than are thermodynamic bond energies.

* * *

Hemodialysis in Treatment of Postoperative Acute Renal Failure Associated With Jaundice—V. F. Lovett (Air Force Hosp., Travis AFB, Calif.), H. Yamauchi, and P. J. Phillippi. Ann. Surg. 160:108 (July) 1964.

Postoperative acute renal failure associated with liver failure in three patients was successfully managed with the aid of hemodialysis. Despite a grave prognosis in such patients, the value of good nursing care and appropriate use of hemodialysis is shown. A brief discussion of the problem and pertinent factors in treatment and prevention is given.

* * *

The Delayed and Prolonged Vascular Leakage in Inflammation. I. Topography of the Leaking Vessels After Thermal Injury—R. S. Cotran and G. Majno, Amer. J. Path. 45:261 (Aug.) 1964.

The site of increased vascular permeability was studied in the delayed-prolonged phase of the vascular response by "vascular labeling" with colloidal carbon. Delayed leakage was induced in the skin of the rat by mild thermal injury. It was found that, in contrast to the increased permeability of the histamine-type transient response, which is restricted to venules, the delayed-prolonged response involves also, and often predominantly, the capillaries.

* * *

Fine Structure of Normal Mucosa in Human Gallbladder—R. D. Evett (911 Third St. SW, Rochester, Minn.), J. A. Higgins, and A. L. Brown, Jr., Gastroenter. 47:49 (July) 1964.

Electron microscopy of human gallbladder epithelium revealed three different cell types: ordinary epithelial cells, pencil-shaped cells, and basal cells. Each of these was described as were the significant details of their ultrastructure. Where possible, correlation of ultrastructure characteristics with functional activity was suggested. Although differences in some details were apparent, human gallbladder epithelium is, in general, morphologically similar to animal gallbladder epithelium.

* * *

Physiological Correlate of Therapeutic Change—E. Vanderhoof and J. Clancy (500 Newton Rd., Iowa City, Iowa), Arch. Gen. Psychiat. 11:145 (Aug.) 1964.

Measurements of physiological variables which were obtained in 30 patients prior to psychotherapy were compared by a correlation analysis with a percentage change in the symptom check list scores before and after psychotherapy. Blood flow was the only variable found to be significantly correlated, with a change in the symptom check list scores (P less .01). The reliability coefficients for blood flow measurements and symptom check scores were .88 and .94 re-

(Continued on Page 66)

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1. Gordon, E.S.: Metabolism 11:819, 1962. 2. Grodsky, G.M. et al.: Metabolism 12:278, 1963. 3. Weller, C. et al.: Scientific Exhibit, A.M.A., June 1962. 4. Sadow, H.S.: Metabolism 12:333, 1963. 5. Faludi, G.: J. Am. Med. Women's Assoc. 18:722, 1963. 6. Faludi, G.: Geriatrics 18:452, 1963. 7. Williams, R.H.: Textbook of Endocrinology, Ed. 3, Saunders, Phila., 1962, p. 610. 8. Weller, C. and Linder, M.: Am. Therap. Soc., June 1963. 9. Moss, J.M. et al.: Med. Times, July 1964.

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(Continued on Page 66)

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(Continued from Page 65)

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REFERENCES AND REVIEWS

(Continued from Page 63)

spectively. In general, it was found that patients with low blood flow under the circumstances of this experiment were the patients who also responded well to psychotherapy, and those with high blood flow did not respond well.

* * *

PATHOGENESIS OF POLYCYSTIC KIDNEYS: HISTORICAL SURVEY
V. Osathanondh and E. L. Potter (851 Estero Blvd., Fort Myers Beach, Fla.). Arch. Path. 77:459 (May) 1964.

Most studies of polycystic kidneys have indicated that all cystic kidneys have a similar pathogenesis, and this has been ascribed by different investigations to (1) failure of branches of the ureteral bud to unite with tubules arising from the metanephric blastema, (2) cystic enlargement of persisting vertigeal generations of nephrons, (3) cystic dilatation of nephrons that detach and fail to reattach, (4) failure of canalization of tubules, or (5) neoplastic adenomatous proliferation. The present authors believe that none of these concepts of the pathogenesis is correct.

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The California Medical Association offers free placement assistance through the Physician Placement Service, 693 Sutter Street, San Francisco, California 94102. This service is for the use of all physicians seeking practice opportunities in California and for C.M.A. members who are seeking an assistant or associate. A bulletin is published every other month.

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Office No. 2—Albert G. Miller (1965), 77 San Mateo Drive, San Mateo 94401. 415 343-9074

SEVENTH DISTRICT—San Francisco County—

Office No. 1—Malcolm S. M. Watts (1966), 909 Hyde Street, San Francisco 94109. 415 776-3838

Office No. 2—Roberta Fenlon (1967), 490 Post Street, San Francisco 94102. 415 986-1391

EIGHTH DISTRICT—Alameda and Contra Costa Counties—

Office No. 1—Harold Kay (1966), 411 Thirtieth Street, Oakland 94609. 415 832-4822

Office No. 2—William F. Kaiser (1967), 3000 Colby Street, Berkeley 94705. 415 843-6515

NINTH DISTRICT—Carl E. Anderson (1967), 1150 Montgomery Drive, Santa Rosa 95405. Del Norte, Humboldt, Lake, Marin, Mendocino, Napa, Solano and Sonoma Counties. 707 546-1922

TENTH DISTRICT—Dave F. Dozier (1965), 2631 K Street, Sacramento 95816. Alpine, Amador, Butte, Colusa, El Dorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, Yolo and Yuba Counties. 916 442-3611

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Office No. 1—Forest J. Grunigen (1967), 3919 Beverly Boulevard, Los Angeles 90004. 213 663-1161

Office No. 2—Joseph P. Cosentino (1965), 1833 Professional Dr., Sacramento 95825. 916 482-2911

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Committee on Allied Health Agencies

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Committee on CALIFORNIA MEDICINE

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David Rubin, Los Angeles.....1967
R. Kirklin Ashley, San Francisco.....1967

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Malcolm S. M. Watts, San Francisco (Chmn.) 1966
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Victor Richards, San Francisco.....1967
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Edward J. Zaik, Los Angeles

Committee on Maternal and Child Care

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Saul J. Robinson, San Francisco.....1965
Leland B. Blanchard, San Jose.....1966
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Russell W. Mapes, Beverly Hills.....1967
Keith P. Russell, Los Angeles (Chmn.) 1967
Forrest H. Howard, Garden Grove.....1967

Committee on Cancer

Sol R. Baker, Beverly Hills.....1965
Walter E. Heck, San Francisco.....1965
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David A. Wood, San Francisco (Chmn.) 1965
Burt L. Davis, Palo Alto.....1966
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John W. Cline, San Francisco.....1967

SUB-COMMITTEES, COMMITTEE ON CANCER:

Committee on Cancer Education

Sol R. Baker, Beverly Hills (Chmn.) 1965
Paul H. Deeb, Loma Linda.....1965
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Maurice Galante, San Francisco.....1965
Justin J. Stein, Los Angeles.....1965

Committee on Tumor Tissue Registry

E. M. Butt, Los Angeles.....1965
John W. Cline, San Francisco (Chmn.) 1965
Lewis M. Guiss, Los Angeles.....1965
James E. Kahler, Los Angeles.....1965
Carl M. McCandless, San Francisco.....1965

Committee on Consultative Tumor Boards

Bert L. Halter, San Francisco.....1965
Walter E. Heck, San Francisco (Chmn.) 1965
Carl L. Moore, Bakersfield.....1965
Otto Pflueger, San Francisco.....1965
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Committee on New and Unproved Methods of Cancer Treatment

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L. Henry Garland, San Francisco.....1965
Paul C. Samson, Oakland (Chmn.) 1965
Ray Seavers, Jr., San Bernardino.....1965
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CONSULTANT:
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Finance COMMITTEE

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Los Angeles 90027
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San Francisco 94117
Victor G. Mikity.....Secretary
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1518 North Sycamore, Santa Ana 92701

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Dwight L. Wilbur, San Francisco	(1963-1964)	Francis J. Cox, San Francisco
J. Norman O'Neill, Los Angeles	(1963-1964)	William F. Quinn, Los Angeles
J. Lafe Ludwig, Los Angeles	(1963-1964)	Harold Kay, Oakland
Burt L. Davis, Palo Alto	(1963-1964)	Leon P. Fox, San Jose
Arlo A. Morrison, Ventura	(1963-1964)	John G. Morrison, San Leandro
James E. Feldmayer, Exeter	(1963-1964)	Charles Grayson, Sacramento
O. W. Wheeler, Riverside	(1963-1964)	Wilbur Bailey, Los Angeles
Malcolm C. Todd, Long Beach	(1963-1964)	Alfred J. Murrieta, Jr., Los Angeles
J. E. Vaughan, Bakersfield	(1963-1964)	Joseph P. O'Connor, Pasadena
Samuel R. Sherman, San Francisco	(1964-1965)	Albert G. Miller, San Mateo
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J. B. Price, Santa Ana	(1964-1965)	Donald C. Dodds, Oakland
Ralph C. Teall, Sacramento	(1964-1965)	Robb Smith, Orange Cove
James C. Doyle, Beverly Hills	(1964-1965)	Homer C. Pheasant, Los Angeles
Wilbur G. Rogers, Glendale	(1964-1965)	Carl M. Hadley, San Bernardino
Charles B. Hudson, Oakland	(1964-1965)	Robert L. Watson, Jr., Los Angeles

(Delegates and Alternates to the A. M. A. are elected for terms of two calendar years. Each office is scheduled for election at the Annual Session of the second year shown above.)

Other Organizations and Medical Schools

Board of Medical Examiners of the State of California

Secretary.....Raymond M. Wallerius
1021 O Street, Room A547, Sacramento 95814
San Francisco.....455 Golden Gate Ave.
Room 4184 94102
Los Angeles.....107 South Broadway 90012
Sacramento....1021 O Street, Room A547 95814

The Public Health League of California

Executive Secretary.....Ben H. Read
955 South Western Ave., Los Angeles 90006
Associate Executive Secretary.....E. E. Salisbury
693 Sutter Street, San Francisco 94102
San Francisco.....693 Sutter Street 94102
415 474-1061
Los Angeles.....955 South Western Ave. 90006
213 731-6397

Department of Public Health of the State of California

Director.....Malcolm H. Merrill, M.D.
2151 Berkeley Way, Berkeley 94704
Berkeley.....2151 Berkeley Way 94704
415 843-7900
Sacramento.....631 J Street 95814
916 442-4711
Los Angeles.....703 State Building 90012
213 620-2900

Medical Schools in California

University of California School of Medicine, Medical Center, San Francisco 94122. Dean: William O. Reinhardt, M.D.

Stanford University School of Medicine, 300 Pasteur Drive, Palo Alto 94304. Acting Dean: Sidney Raffel, M.D.

University of Southern California School of Medicine, 2025 Zonal Avenue, Los Angeles 90033. Dean: Roger O. Egeberg, M.D.

Loma Linda University, School of Medicine, 1720 Brooklyn Avenue, Los Angeles 90033. Dean: David Burdg Hinshaw, M.D.

University of California at Los Angeles, School of Medicine, Hilgard Avenue, Los Angeles 90024. Dean: Sherman M. Mellinkoff, M.D.

California College of Medicine: 1721 Griffin Avenue, Los Angeles 90031. Dean: Warren L. Bostick, M.D.

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Society secretaries are requested to notify California Medicine promptly when changes are indicated in their roster information

ALAMEDA-CONTRA COSTA Medical Assn., 6230 Claremont Ave., Oakland 94618. Meets quarterly.
Paul H. Cronenwett.....President
6230 Claremont Ave., Oakland 94618
J. Brandon Bassett.....Secretary
2930 McClure St., Oakland 94609

BUTTE-GLENN Medical Society, P. O. Box 1008, Chico 95927. Meets Fourth Thursday.
Jay O. Gibson.....President
170 E. 2nd Ave., Chico 95926
Dale W. Ritter.....Secretary
6 Cohasset Circle, Chico 95926

FORTY FIRST Medical Society, 4775 Santa Monica Blvd., Los Angeles 90029.
Loron N. McGillis.....President
11230 Magnolia Blvd., No. Hollywood 91601
Glenn F. Gordon.....Secretary
1630 Del Valle Ave., Glendale 91208

FRESNO County Medical Society, 2155 Amador, Fresno 93721. Meets Second Tuesday, 6:30 p.m., Sunnyside Country Club.
Norman E. Tostenson.....President
1223 Wishon Ave., Fresno 93728
Joseph B. Ford, Jr. Secretary
2940 Fresno St., Fresno 93721

HUMBOLDT-DEL NORTE County Medical Society. Meets Second Thursday.
Robert Devine.....President
730 7th St., Eureka 95501
Wells Carey.....Secretary
2822 E St., Eureka 95501

IMPERIAL County Medical Society. Meets Second Tuesday, 8 p.m., Pioneer Memorial Hospital, Brawley.
Nathan Wolf.....President
126 Main St., Brawley 92227
Ernest Brock Secretary
200 S. Imperial Ave., Imperial 92251

INYO-MONO County Medical Society. Meets Fourth Tuesday except December, January, February.
D. L. Christenson.....President
380 N. Mt. Whitney Dr., Lone Pine 93545
W. Ray Hartwig.....Secretary
459 West Line, Bishop 93514

KERN County Medical Society, 2603 G Street, Bakersfield 93301. Meets Third Tuesday, 7:30 p.m., Society Office, 2603 G Street, except June, July, August.
Hans E. Einstein.....President
2441 "G" St., Bakersfield 93301
Keith W. Spaulding.....Secretary
2521 "G" St., Bakersfield 93301

KINGS County Medical Society. Meets Second Thursday, 7:00 p.m. Place to be announced.
Clyde Ball.....President
1320 Whitley Ave., Corcoran 93212
Edwin E. Kerr.....Secretary
208 N. Douty St., Hanford 93230

LASSEN-PLUMAS-MODOC-SIERRA County Medical Society. Meets on call.
Lloyd Shannon.....President
P. O. Box 963, Alturas 96101
Robert C. Haggard.....Secretary
Box 426, Loyalton 96118

LOS ANGELES County Medical Assn., 1925 Wilshire Blvd., Los Angeles 90057.
Elmer F. Gooel.....President
1925 Wilshire Blvd., Los Angeles 90057
George C. Andersen.....Secretary
1925 Wilshire Blvd., Los Angeles 90057

MARIN Medical Society, 1601 Second St., Suite 106, San Rafael 94901. Meets First Thursday, 7:00 p.m.
Calvin Plumhof.....President
711 D St., San Rafael 94901
John McGee Secretary
712 D St., San Rafael 94901

MENDOCINO-LAKE County Medical Society.
Thomas Nicholson.....President
408 W. Perkins St., Ukiah 95482
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728 S. State St., Ukiah 95482

MERCED County Medical Society. Meets Fourth Thursday, Hotel Tioga, Merced.
James A. Parker.....President
535 W. 26th St., Merced 95340
Patrick J. Maloney.....Secretary
656 W. 20th St., Merced 95340

MONTEREY County Medical Society, P. O. Box 308, Salinas 93903. Meets First Thursday.
Osman H. Hull.....President
716 Cass St., Monterey 93940
Joseph E. Turner.....Secretary
1073 Cass St., Monterey 93940

NAPA County Medical Society. Meets Second Wednesday, P. O. Box 658, Napa 94559
E. Paul White, Jr. President
P. O. Box 658, Napa 94559
Richard Clark.....Secretary
1054 Beard Rd., Napa 94558

ORANGE County Medical Association, 300 S. Flower, Orange 92666. Meets First Tuesday, 7:00 p.m.
Hugh J. Plumb, Jr. President
1901 Westcliff Dr., Newport Beach 92663
Laurance A. Mosier.....Secretary
10510 Chapman St., Garden Grove 92640

PLACER-NEVADA County Medical Society. Meets Second Wednesday.
Clifford W. Wauters.....President
701 High St., Auburn 95603
Arthur R. Weaver.....Secretary
701 High St., Auburn 95603

RIVERSIDE County Medical Association, 4175 Brockton Ave., Riverside 92501. Meets Second Monday, 7:30 p.m., Spanish Arts Gallery, Mission Inn.
Donald P. Carpenter.....President
3660 Arlington Ave., Riverside 92506
Richard W. Trotter.....Secretary
6876 Magnolia Ave., Riverside 92506

SACRAMENTO Society for Medical Improvement, 5380 Elvas Ave., Sacramento 95819. Meets Third Tuesday, 8:30 p.m., Sutter Hospital Auditorium.
L. Morgan Boyers.....President
2615 Eye St., Sacramento 95816
James W. Martin.....Secretary
2811 L Street, Sacramento 95816

SAN BENITO County Medical Society. Meets once a month, except July and August. Time and place to be announced.
Kent S. Taylor.....President
345 5th St., Hollister 95023
Robert D. Quinn.....Secretary
535 Monterey St., Hollister 95023

SAN BERNARDINO County Medical Society, 1875 N. D St., San Bernardino 92405. Meets First Tuesday, 7:30 p.m., Harold's Club, Fontana.
Merlin A. Hendrickson.....President
238 N. Riverside Ave., Rialto 92376
Nicholas P. Krikes.....Secretary
25060 Base Line, San Bernardino 92410

SAN DIEGO County Medical Society, 3427 - 4th Ave., San Diego 92103. Meets Second Tuesday. Location of meetings varies.
Walter R. Nickel.....President
233 A St., San Diego 92101
Purvis L. Martin.....Secretary
2105 5th Ave., San Diego 92101

SAN FRANCISCO Medical Society, 250 Masonic Ave., San Francisco 94118.
John B. Schaupp.....President
250 Masonic Ave., San Francisco 94118
George K. Herzog, Jr.....Secretary
250 Masonic Ave., San Francisco 94118

SAN JOAQUIN County Medical Society. Meets First Thursday, 8:15 p.m., 445 W. Acacia St., P. O. Box 230, Stockton 95201.
David Leon Green, Jr.....President
2633 Pacific Ave., Stockton 95204
Dora A. Lee.....Secretary
2420 N. California St., Stockton 95204

SAN LUIS OBISPO County Medical Society. Meets Third Saturday, 7:00 p.m., Anderson Hotel, San Luis Obispo 93402.
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743 Pismo St., San Luis Obispo 93401
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705 Grand Ave., San Luis Obispo 93402

SAN MATEO County Medical Society, 122 El Camino Real, San Mateo 94401. Meets Third Tuesday.
Ward L. Hart.....President
100 Laurel Ave., San Carlos 94401
Howard W. Lindsey.....Secretary
323 N. San Mateo Dr., San Mateo 94401

SANTA BARBARA County Medical Society, 300 W. Pueblo St., Santa Barbara 93105. Meets Second Monday of the month, University Club, 1332 Santa Barbara St., Santa Barbara.
H. L. Stewart, Jr.....President
300 W. Pueblo St., Santa Barbara 93105
Thurman K. Hill.....Secretary
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SANTA CLARA County Medical Society, 700 Empey Way, San Jose 95128. Meets First Monday.
S. Fred Kaufman.....President
700 Empey Way, San Jose 95128
Jacob M. Stone.....Secretary
700 Empey Way, San Jose 95128

SANTA CRUZ County Medical Society. Meets every Second Month, Second Tuesday. Time, place to be announced.
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850 Main St., Watsonville 95076
John W. Morris.....Secretary
230 Walnut Ave., Santa Cruz 95060

SHASTA-TRINITY County Medical Society. Meets Second Monday of the month. Place to be announced.
Michael J. Hamilton.....President
1348 Market St., Redding 96001
Robert G. Taylor.....Secretary
1308 Court St., Redding 96001

SISKIYOU County Medical Society. Meets Sunday on call.
William D. Schnack.....President
8 Main St., Weed 94096
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SOLANO County Medical Society. Meets Second Tuesday, 8:00 p.m., at different meeting places.
R. Matthew Gibbons.....President
1200 Marin St., Vallejo 94590
John C. Miller.....Secretary
410 Tennessee St., Vallejo 94590

SONOMA County Medical Society, 576 B Street, Santa Rosa 95401. Meets Second Thursday.
A. A. Thurlow, Jr. President
185 Sotoyome St., Santa Rosa 95405
Tetsuro Fujii.....Secretary
1667 Bloomfield Rd., Sebastopol 95472

STANISLAUS County Medical Society, 303 Downey Ave., Modesto. Meets Third Tuesday of the month, 7 p.m., Hotel Covell, Modesto 95354.
John S. Woolley.....President
808 13th St., Modesto 95354
Jeanne I. Miller.....Secretary
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TEHAMA County Medical Society. Meets at call of President.
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343 Oak St., Red Bluff 96080
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210 S. Main St., Red Bluff 96080

TULARE County Medical Society, 1640 West Mineral King, P. O. Box 16, Visalia 93278.
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302 Glen Ellen Dr., Ventura 93003
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3081 Loma Vista Rd., Ventura 93003

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*Cass, L. J. and Frederik, W. S.: To be published.

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Community Health Week Is October 18-24

The second annual Community Health Week will be observed across the nation October 18-24.

Dr. F. J. L. Blasingame, executive vice president of the American Medical Association, said most of the 2,000 medical societies and more than 20,000 public and private health agencies will commemorate the occasion by holding special community health programs.

The spotlight will be on health progress, medical advances and the health services and facilities available in each community.

Community Health Week also will pay tribute to the more than two and one-half million physicians, nurses, druggists, technicians and others who follow full-time careers in the health field and to the millions of others who have part-time jobs in the field or serve with voluntary health agencies.

Study Indicates Body Build Predisposes to Obesity

A study of obese adolescent girls indicates that body build, and hence genetic factors, are a predisposing factor in obesity.

Among 180 girls, most of whom were aged 12 to 17, all but five were predominantly endomorphs, Carl C. Seltzer, Ph.D., and Jean Mayer, Ph.D., Harvard University School of Public Health, Boston, reported in the August 31 *Journal of the American Medical Association.*

The endomorph has a roly-poly physique with the abdomen larger than the chest and relatively small hands and feet, is muscular, and has prominent body joints.

"Presumably, the prime prerequisite for the development of obesity is a physique with at least a moderate amount of endomorphy under normal nutritional conditions," the researchers said. "Endomorphy predisposes to the laying on of fat unless insufficient diet, excessive activity, disease, or voluntary weight control supervenes."

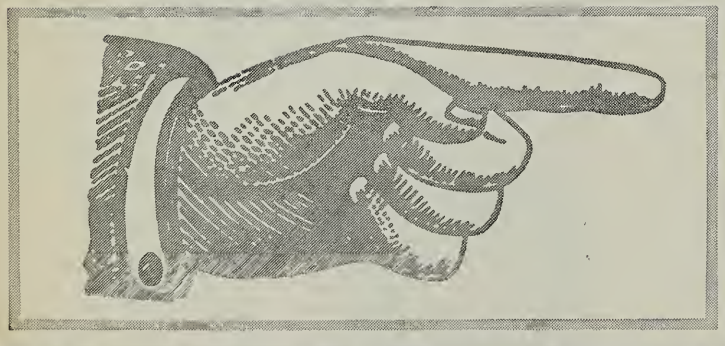
However, they added that even among endomorphs there is considerable individual differences in the tendency to accumulate fat and not all endomorphs become obese.

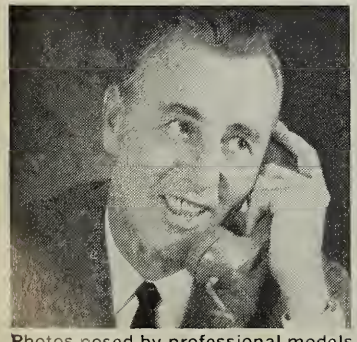
"While these results in no way detract from the concept that caloric intake in excess of caloric expenditure is the immediate cause of obesity, a recognition of the constitutional individuality of the person may well give a greater understanding of the common observation that, under similar environmental circumstances, some of us become obese and others do not," the researchers commented.

The findings, they stressed, may not hold true for adult obese men and women, or perhaps even obese adolescent boys.



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"In adults, particularly, the problem is much more complex since one must deal with those physical types which are prone to a sudden blossoming into middle-age obesity," they pointed out. "Any study of adults, therefore, must distinguish between those whose obesity is long standing, going back to childhood and adolescence, and those whose obesity is a singular characteristic of midlife."

The authors said they believed endomorphy would still predominate among the overweight girls studied even if they shed enough fat to be of normal weight for their age, sex, and height, although final proof would rest on lengthier studies.

The study also uncovered a somewhat greater tendency to mesomorphy among obese girls than is generally found among girls of similar ages. On the other hand, there was an extremely low rate of ectomorphy, the lanky physique with delicate bony structure and stringy muscular development.

"Not only are our obese subjects less ectomorphic than the general population or even the highly endomorphic elements of the general population, they also reflect the total absence of a wide variety of ectomorphic physical types," the researchers commented. "Apparently, nature is intolerant of obesity in ectomorphic types."

Those in the study group, aside from being overweight, were apparently healthy. Most were girls attending a summer weight-control camp (Camp Seascape, East Brewster, Mass.), while others were seen at the out-patient clinic of the Adolescent Unit of Children's Hospital Medical Center, Boston.

"Genetic factors are known to play an important role in the development of obesity among experimental animals, yet . . . relatively little attention has been focused on the genetic factors in the development of obesity in humans," according to an accompanying editorial in the Journal.

"Granted that typing of obesity is at its very infancy in humans, it appears reasonable to think that only when distinct syndromes resulting in prolonged positive energy balance have been identified and their pathogenesis understood will it be possible to treat obesity 'in depth' rather than merely to manipulate food intake and exercise to establish a negative energy balance.

"The preliminary work of Seltzer and Mayer may well lead to the early identification of those predisposed to slimness as well as obesity. With observations showing the familial—and probably genetic—character of the predisposition to obesity, their study should lead us to look at obesity as a medical rather than a moral problem, and regard the obese person as a victim of anatomic and physiologic circumstances rather than as just a glutton."

Dr. Seltzer is a research associate in physical anthropology and Dr. Mayer is an associate professor of nutrition.

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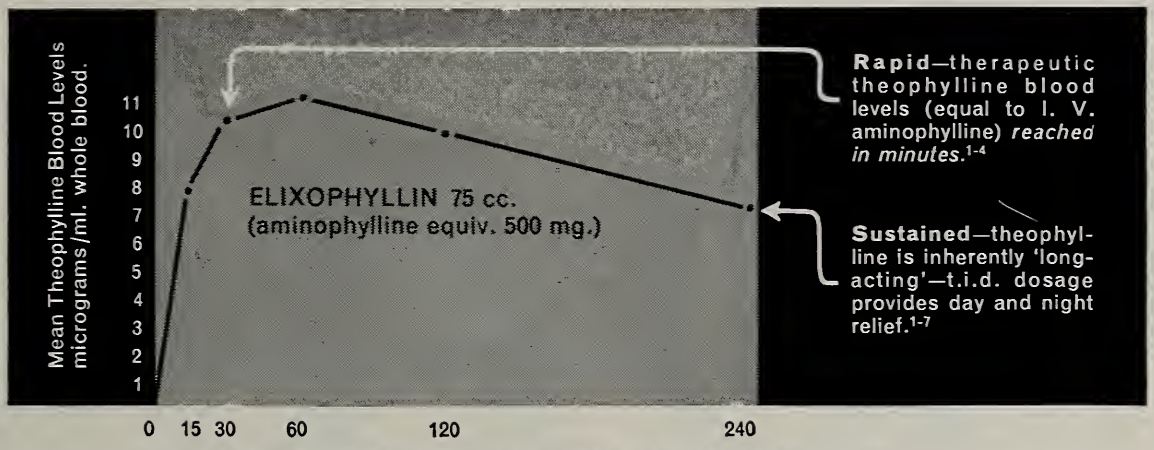
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References: (1) Kessler, F.: Connecticut S.M.J. *21*:205 (March) 1957. (2) Burbank, B.; Schluger, J., and McGinn, J.: Am. J. Med. Sci. *234*:28 (July) 1957. (3) Spielman, A.D.. Ann. Allergy *15*:270 (June) 1957. (4) Greenbaum, J.: Ann. Allergy *16*:312 (May-June) 1958. (5) Kessler, F.: Medical Times *87*:1298 (Oct.) 1959. (6) Bickerman, H.A., and Barach, A. L., in Modell, W.: Drugs of Choice 1960-1961, St. Louis, The C. V. Mosby Company, 1960, p. 516. (7) Wilhelm, R. E. in Conn., H. F.: Current Therapy—1961, Philadelphia, W. B. Saunders Company, p. 417. (8) Schluger, J. McGinn, J. T., and Hennessy, D. J.: Am. J. Med. Sci. *233*:296, 1957.

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Rejoining Severed Arm Worthwhile for Some

Replantation of severed arms is a worthwhile procedure for certain patients under certain circumstances, two Boston surgeons said.

The restoration of arms in two patients, a 12-year-old boy and a 44-year-old man, was reported by Drs. Ronald A. Malt and Charles F. McKhann in the September 7 *Journal of the American Medical Association.*

"Functional recovery in the arms has now made it clear that replantation in selected cases is a worthwhile procedure," they said.

The boy, whose right arm was rejoined below the shoulder in 1962, can lift 10-pound weights and write his name, they reported. He has sensation in all five fingers. He also can move his shoulder and elbow although he does not have full extension. The boy currently is wearing a splint until further surgical procedures are carried out sometime in the near future.

The other patient, whose right arm was severed just above the elbow in 1963, is now working full-time as a machinists' supervisor, according to the report. Strength is increasing in the fingers and movement of the shoulder is only somewhat restricted. However, no independent movement of the elbow is possible. Further reconstruction procedures also are planned for this patient.

Replantation of a totally amputated extremity is largely the applied synthesis of existing knowledge, the surgeons commented. By 1944 the surgeon's attitude and skill were "unquestionably adequate," they said, although replantation was not performed in two major wars. Replantation became an established laboratory procedure in the present decade, and well-trained surgeons repaired combinations of injuries of the extremities so severe that attempts to distinguish the degree of separation of a limb were "mostly matters of semantics," they pointed out.

Although the trained surgeon has the ability to perform a successful arm replantation, the authors warned that the magnitude of the subsequently required reconstructive procedures means that the hospital must have the resources to provide the patient better function than he could achieve with a good artificial arm.

If the hospital has the necessary facilities, they said, "we believe that indications for replantation currently exist in the actively productive person with a severed arm, no detectable injury to vital internal organs, no urgent problem with respect to the other arm, and a positive desire for his own limb at the expense of unpredictable periods of hospitalization and unpredictable end result.

"With advances in surgical science, the indications will undoubtedly be broadened."

The authors are affiliated with Massachusetts General Hospital and Harvard Medical School.

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Rise in Food Poisonings Prompts Prevention Plea

A "dramatic increase" in the number of food poisonings caused by salmonella, a class of intestinal bacteria, prompted a plea for greater preventive efforts in the August 31 *Journal of the American Medical Association.*

There were 9,680 cases of salmonellosis in the United States in 1962 compared with 723 in 1945, according to a Journal editorial.

"Effective control of salmonellosis can result only if physicians and health officials of every country, veterinarians and wildlife experts, farmers and industrialists, as well as governmental agencies dealing with health, agriculture, and food, and the general public will work in cooperation toward this desirable and obtainable goal," the editorial said.

Infections from salmonellae are acquired by the oral route, usually by ingestion of contaminated food or drink, according to the editorial.

The major sources of human infection are livestock and domestic animals. The foods most often implicated are poultry, eggs, milk, prepared meats, sausage, meat pies, desiccated coconut, cake mixes, and custard-filled bakery products which are lightly cooked and subject to much handling. Animal foods and fertilizers are also a source of infection.

The editorial called for improved operating procedures in food processing plants, including rapid handling and adequate refrigeration of food, and hygiene of plant and personnel.

Salmonellae are susceptible to heat, radiation, and disinfectants, the editorial pointed out. To insure destruction of salmonellae in food, the temperature must be raised throughout the food to an appropriately high degree for a sufficiently long time, such as 140 degrees Fahrenheit for 20 minutes or 149 degrees Fahrenheit for three minutes, it said.

Refrigeration will prevent multiplication of bacteria but will not kill them.

F.D.A. Reversal on Antidepressant Supported in J.A.M.A. Editorial

The decision of the Food and Drug Administration to permit the return of an antidepressant drug to the market was supported in an editorial in the September 7 *Journal of the American Medical Association.*

The prescription drug, tranylcypromine sulfate (Parnate), was taken off the market last February by its manufacturer, Smith Kline & French Laboratories, Philadelphia, "after strong pressure from the F.D.A., but under firm protest by the company," according to the editorial, signed by the A.M.A. Department of Drugs.

Shortly before a public hearing on the matter was to be held, the editorial said the F.D.A. announced

(Continued on Page 46)

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California Medicine

Severe Colonic Bleeding

W. RUSSELL SMITH, M.D., *and* CLARENCE J. BERNE, M.D.
Los Angeles

■ *Patients requiring emergency operation for severe acute colonic hemorrhage usually arrive in the operating room inadequately studied and the point of bleeding not known. A well planned procedure for making an operative diagnosis is lacking.*

The fact that diverticular disease is the most common cause of massive colonic bleeding, dominates the surgical management of this problem. A critical interpretation of the color and the consistency of the stools must be made by the surgeon. Since the bleeding lesion is usually otherwise clinically silent, the character of the stools may be the only indication of the level of bleeding and the rate and the amount of the blood loss. A proctoscopic examination, followed by an emergency barium enema study if possible, is always done before subjecting a patient to laparotomy.

The indications for emergency operation include acute exsanguinating hemorrhage, less severe but persistent colonic bleeding and recurrent colonic bleeding. The steps for the operative diagnosis and the surgical procedure utilized for a specific situation are discussed.

MODERATE OR SEVERE acute colonic bleeding may at any time become exigent and demand immediate and very aggressive management. Occasionally the bleeding may be massive from the onset and require very early emergency surgical intervention to prevent exsanguination. The surgical problems presented by colonic bleeding have been less adequately studied than those related to severe bleeding from the upper gastrointestinal tract. The methods used for determining the level and the causes of bleeding in the lower mid-bowel and colon are much less precise than those available for getting such information about the upper tract. Further, the operative diagnostic procedures available at the time of laparotomy for severe colonic bleeding are less accurate and much more cumbersome than those for gastroduodenal bleeding. Operative diagnosis is compounded by the length and the anatomical course of the colon. Such severe colonic bleeding usually occurs in older patients, many of whom have advanced arteriosclerotic cardiovascular renal disease. With consequent areas of borderline perfusion, there is an enhanced susceptibility to the complications of hemorrhage and resultant hypovolemia. The purpose of this paper is to present current methods for the diagnosis and management of acute colonic bleeding.

From the Department of Surgery, University of Southern California School of Medicine, Los Angeles.

Presented before the Section on General Surgery at the 93rd Annual Session of the California Medical Association, Los Angeles, March 22 to 25, 1964.

Etiology

In adults, the most common cause of mild and moderate colonic bleeding is carcinoma, but it is uncommon for such a lesion to cause massive bleeding. In our series of patients with acute severe colonic bleeding requiring surgical operation, diverticulosis was the cause in over 70 per cent. In over half of these, diverticulitis was not present. In the others, with one exception, diverticulitis was mild.

Scarborough[12] and other investigators[4,10] have repeatedly emphasized that simple diverticulosis is not a common cause of acute colonic bleeding, stating that if a patient is observed long enough an associated polyp or an occult malignant lesion will ultimately be found. In the recent surgical literature there is quite consistent agreement that diverticulosis is the most common cause of acute massive colonic hemorrhage.[3,6,7,13] Other much less frequent causes of massive bleeding are carcinoma, polyps, ulcerative colitis and relatively rare lesions such as pseudolipoma of the ileocecal valve. Therefore, in a case in which the colon is overtly otherwise normal, either by radiological examination or as observed at operation, diverticular disease, if present, is overwhelmingly the most likely cause of the bleeding. This fact dominates the surgical management of massive colonic bleeding.

Terminology

Definition is needed for certain clinical terms concerning gastrointestinal bleeding. The word *hematemesis* is used to describe vomitus containing red blood with or without clots, and connotes eruptive bleeding. This is almost invariably from above the ligament of Treitz and more often than not of gastric origin. *Melenemesis* is present when the vomitus contains dark blood. Such dark blood is characteristic of noneruptive esophageal or gastric bleeding, or severe duodenal bleeding with regurgitation. *Hematochezia* indicates the passage from the rectum of bright red blood with or without clots. Only occasionally is this due to eruptive downward bleeding from a duodenal ulcer or from any source in the midbowel below that level. Usually, in adults, it is indicative of moderate or severe bleeding from the colon. *Melena vera* is used to describe material containing black ("old") blood when passed per rectum. Characteristically, this material is coal black, shiny, foul smelling, sticky and firm. In appearance and consistency it closely resembles tar. Stools of this type occur when a large amount of blood traverses the small bowel and colon slowly. During transit, most of the water in the shed blood is absorbed and this water, restored to the circulating blood, brings about hemodilution. *Pseudomelena* describes a black stool that, on casual examination, looks like melena. However, it is not as shiny, sticky or firm. On close inspection of a recently passed stool, the surface has a dark red sheen and when placed against a white background (cardboard container), a narrow red zone may be seen around the periphery. Typically, stools of this type are seen when moderate bleeding into the right colon occurs. A similar hemorrhage into the lower colon would produce hematochezia. Gradations occur between pseudomelena and hematochezia depending upon the rate and volume of the shed blood and the level of input into the colon.

Diagnosis of Level of Bleeding

Uniquely, most of the lesions productive of acute colonic bleeding are otherwise clinically silent. Consequently, determining the level of the bleeding depends in large part on an unusually careful study of the color and consistency of the stools by the surgeon. If blood is vomited, obviously the source is high in the gastrointestinal tract. However, gastroduodenal bleeding without vomiting can often easily be detected if a gastroduodenal tube is put in place. Without such intubation, gastroduodenal bleeding may be completely overlooked. The presence of melena vera almost completely excludes the colon as the site of origin of the blood. When pseudomelena or hematochezia is present, a colonic source of the bleeding should always be strongly suspected. However, hematochezia with shock should always suggest duodenal ulcer as the cause. Hematochezia without shock is much more indicative of colonic bleeding. Preservation of the stool for early inspection by the surgeon, instead of relying on the nurses' notes, may be critical in differentiating borderline hematochezia, pseudomelena and melena vera. It is to be emphasized that, unless this is done, these differentiations indicative of the various levels, rates and amounts of gastrointestinal blood loss are often not made and not critically interpreted. This fact, in conjunction with the lack of a "vigorous diagnostic approach"[8] actually may result in an operation directed at one end of the intestinal tract when the bleeding is arising from the other.

Management

When a patient has major gastrointestinal bleeding, a "bleeding chart" recording the patient's course is started. This includes the vital signs, hematocrit, the amount, character and route of blood loss, the amount of blood given, and other pertinent data. With the data thus progressively summarized, the site of input and the amount of bleeding can be more precisely judged. In addition to a complete history, physical examination and the data on the bleeding chart, the patient must be asked particularly about any abnormal bleeding tendencies and any chronic

use of drugs, especially anticoagulant therapy and gastric mucosal irritants. A platelet count and determination of prothrombin time and blood urea nitrogen are needed in addition to the routine studies. In the absence of renal insufficiency, hyperazotemia is strongly suggestive of bleeding high in the tract. Blood transfusions, intravenous colloids and other fluids are given as indicated. Concurrently, a mercury weighted tube is passed into the stomach if there is the slightest possibility that the bleeding could be originating from the upper gastrointestinal tract. This is intermittently aspirated and not placed on continuous suction. If the gastric aspirate does not show blood, meticulous proctoscopic examination, using good suction apparatus, is carried out. Laparotomy for colonic hemorrhage should never be done unless there is proctoscopic proof that transrectal control of the bleeding is not possible. If there is sustained profuse hemorrhage and the blood volume cannot be maintained satisfactorily, exploratory laparotomy may be indicated. One should always be aware of the possibility of the production of a measurable defect in coagulation induced by the transfused blood if more than 3,000 ml is required in less than 24 hours. If more than that amount is needed, operation may be advised before such a coagulopathy becomes severe. If the bleeding is less severe than that, an emergency barium enema study is usually done as soon as the original blood loss has been replaced. In spite of the radiologist's frustrations associated with a barium enema done under such adverse conditions, it is an essential part of the study if the nasogastric tube has not revealed blood. A saline cleansing enema should be given to clear the right colon. Without such an enema, in patients with this degree of bleeding the left colon is usually quite well shown by the barium enema but the right colon is usually poorly visualized. The barium enema will usually demonstrate larger lesions such as those produced by carcinoma, polyps, diverticula or ulcerative colitis. The barium enema may show a normal colon in the presence of bleeding of colonic origin. Hypaque® is generally inferior to barium for this type of study.

When the foregoing management has been completed, 12 to 24 hours may have elapsed. The blood volume should have been restored to normal and the decreased red cell mass adequately corrected. If the amount of blood required for maintenance is greater than 1,500 ml per 24 hours, operation is advisable, whether or not a lesion has been demonstrated. In the majority of patients, the colonic bleeding will subside and not that much blood will be required. With continued, but less severe bleeding, it is reasonable to temporize with such a patient for four to five days. In this time a very adequate study can be accomplished, including passing a nasogastric tube into the small bowel and withdrawing it. If the barium enema has not established the cause of bleeding, an upper gastrointestinal series is done during this period. If gastroduodenal bleeding is still a possibility, esophagoscopy and gastroscopy may be indicated, and a barium study of the small bowel may be done. If the bleeding has not subsided by this time, and operation is considered necessary, and no demonstrable lesion has been found, it can be reasonably concluded that the bleeding point is not in the upper tract. Operation may be advised at this time in order to detect the causative lesion while it is actively bleeding. Such a policy is uniquely important because in the colon there is a high frequency of seemingly innocent diverticular disease that is responsible for the bleeding.

Indications for Emergency Surgery

In the foregoing discussion on the concurrent management and diagnosis of severe colonic bleeding, operation was advised in three different situations. In the first, the patient had profuse exsanguinating hemorrhage, nasogastric intubation was feasible and negative, but the barium enema was not possible. In the second group, the colonic bleeding was less severe, allowing time for a fairly complete study. Patients of this order required about 1,500 ml of blood per 24 hours for maintenance of blood volume. A third group was made up of patients with persistent but less severe bleeding averaging about 500 ml per 24 hours but without subsidence of bleeding; they were operated upon on the fourth or fifth day after a complete study was accomplished.

Even less severe colonic bleeding, if it is recurrent, may be an indication for emergency operation in order to try to detect the site of bleeding when previous studies have not shown a lesion likely to cause the bleeding.

It is paradoxical that when there is severe gastrointestinal bleeding in an aged patient, the surgeon's tendency is to become more conservative. Actually, though, since the risks of damage from hemorrhage are greater in the aged, it is probable that appropriate operation should be done earlier unless there are contraindications. The risks that are greater with age are myocardial insufficiency or infarction, cerebral vascular accident and thromboembolic disease.

Operative Diagnosis

Nearly always if operation is done during active gastroduodenal bleeding, the surgeon will be able to detect the bleeding site and the causative lesion. This is not true of emergency operation that is done for bleeding into the colon with the cause unknown. The surgeon is easily baffled if the colon is tautly filled with blood and no lesion is evident. Also, diverticu-

losis may be immediately evident but cannot be initially assumed to be the cause of bleeding. The filling of the colon may be owing to retrograde bleeding from a site as far distant from the cecum as the rectum. In such circumstances the surgeon may, without further diagnostic steps, elect to do an abdominal colectomy or transverse colostomy.

The procedures available to make a precise operative diagnosis in the absence of an overt lesion are extensive and hazardous but may be justified if conditions permit. We initiate our procedure in such cases by segmentalizing the lower left colon with cloth-wrapped intestinal clamps[5] followed by serial transrectal irrigations of the segments. If the left lower colon is not found to be the site of bleeding, the right colon is explored. Colotomy of the ascending colon is done and the cecum everted for inspection. Colonoscopy of the remainder of the right colon and the transverse colon can then be done. After this is completed, any site of input of active bleeding will have been detected. At any step of the foregoing procedure, appropriate operation is done if the bleeding site is found. If no lesion has been found at this stage, a sigmoid colotomy is made and colonoscopy of the left colon is carried out because bleeding from an existent lesion may have stopped at the time of operation.

The irrigation is done with a No. 30 Bardex catheter and an inflatable balloon which is inserted preoperatively. This has been attached to a sterile apparatus which connects to a Y-tube with one limb to an elevated receptacle containing a solution of 1:10,000 of aqueous zephiran. The other limb is attached to a wall suction. This arrangement allows for alternate filling and emptying of the colon from below. Once the colon is completely cleansed, any bleeding into the segment will be evidenced by the appearance of fresh blood upon reirrigation.

The study of the sigmoid is carried out in two steps with such serial irrigations. First, the clamp is placed at the mid-sigmoid level and the lower sigmoid is irrigated. This clamp is then moved to the junction of the descending sigmoid and the entire sigmoid colon is then again irrigated. With the sigmoid colon clean and no source of bleeding found, the clamp is left at the descending sigmoid junction. While waiting for possible bleeding into the segment, the right colon is mobilized. The sigmoid colon is then again lavaged for fresh blood. If no blood appears, a cloth-wrapped clamp is placed across the right colon just proximal to the hepatic flexure. A 6 cm longitudinal colotomy incision is made in the first portion of the ascending colon above the cecum. Any blood in the lumen is aspirated and the mucosa is cleansed with an aqueous zephiran-soaked sponge. By everting the entire wall with one or two fingers, the mucosa of the cecum and ascending colon can be completely and directly vizualized. The ileocecal valve is readily seen and opened, and the mucosa of the terminal ileum then may be directly visualized. The clamp is then moved from the ascending colon to the distal transverse colon. The blood is aspirated from this segment and the ascending and transverse colon are carefully examined with a colonoscope. Depending on the length and the mobility of the left colon, it is optional at this point whether to serially irrigate the entire left colon for evidence of fresh blood or to make a sigmoid colotomy and examine the left colon colonoscopically. Our usual preference is first to irrigate as completely as possible. If this is unsatisfactory, the sigmoid colotomy is made and the entire left colon is examined.

At this point, all the mucosa of the colon has been carefully visualized. This may be an extensive, hazardous and unrewarding procedure. Detaching the flexures is usually the major difficulty in doing a complete colonoscopic examination. However, it is essential that trauma to the colon be minimized. A sterile sigmoidoscope is used and it is passed under direct vision with the obturator in place. The obturator is then removed, the light inserted and the overhead lights dimmed. With one hand on the outside of the colon at the distal end of the scope, the instrument is slowly withdrawn while the mucosa is manipulated at the end of the scope. A moderate amount of inflation of the colon may be helpful. As the lumen is nearly the size of the scope, the transverse and descending colon will lend themselves particularly well to this type of an examination and the mucosa is usually well visualized. In contrast to this, the lumen in the area of the cecum and the ascending colon has a larger diameter, but the bowel is more distensible and lends itself particularly well to eversion and direct visualization as described. Gentle handling of the mucosa is imperative because traumatic bleeding is easily produced by the scope and may be mistaken for the anticipated lesion. Additional colotomy may occasionally be required for better visualization of a particular area or segment.

Operative Procedure

When the bleeding lesion is identified, the operation appropriate for the given situation is done. When a bleeding area or the segment of the colon from which bleeding is occurring is identified, but without a demonstrable lesion, the segment should be resected, if feasible. If no causative lesion is found and no bleeding area identified and diverticulosis is absent, a "blind" left colon resection cannot be justified. Closure of the incision in the hope that the bleeding will subside (which it may do temporarily) cannot be justified. In the very unusual situation with no lesion identified and diverticulosis not pres-

ent, our procedure of choice is proximal transverse colostomy which will localize and usually control the bleeding if the source is distal to the colostomy. Should the bleeding continue from the proximal limb, temporary ileostomy may be required to save the patient. Then an elective right colectomy may be done later.

With diverticulosis of the lower left colon present, and the remainder of the colon and gastrointestinal tract exonerated by the surgeon, a proximal transverse colostomy will usually control the bleeding if it is of diverticular origin. The preferable alternative is sigmoidectomy if this can be tolerated. This may wisely be accompanied by exteriorization of the right colon so that if subsequent bleeding occurs, the exteriorized colon can be opened and the bleeding site localized in relation to it; or the exteriorized colon may be opened initially.

If the diverticulosis is of both the right and left colon, transverse colostomy is usually done. If further severe bleeding from the proximal limb occurs, an ileostomy may be preferable to right colectomy. Abdominal colectomy with ileoproctostomy is a justified procedure for interim operation in such a patient where a cause for colonic bleeding cannot be found. It may be used as an emergency procedure where the conditions are very favorable and where diverticular disease is universal in the colon. We have found it satisfactory under these conditions. In one extremely complex case, success was achieved with ileoproctostomy, leaving the abdominal colon intact, with the sigmoid cut end brought out as a neostomy. This avoided an ileostomy and colectomy in a patient who could not have tolerated an abdominal colectomy.

1930 Wilshire Boulevard, Los Angeles 90057 (Smith).

REFERENCES

1. Cate, W. R.: Colectomy in treatment of massive melena secondary to diverticulosis, Ann. Surg., 137:558, 1953.

2. Dunning, M. W. F.: Clinical features of hemorrhage from diverticula of the colon, Gut, IV:273, 1963.

3. Hoar, C. S.: Colonic bleeding and diverticular disease of the colon, Surg. Gynec. & Obst., 99:101, 1954.

4. Judd, E. S.: Diverticulitis of the colon, Ann. Surg., 80:425, 1924.

5. Maynard, E. P. III: Arterial hemorrhage from a large bowel diverticulum, Gastroenterology, 31:210, 1956.

6. Mobley, J. E., Waigh, J. M., and Dockerty, M. B.: Bleeding in colonic diverticulitis, Amer. J. Surg., 94:44, 1957.

7. Noer, Rudolf J., Hamilton, J. E., Williams, R. J., Broughton, D. O.: Rectal hemorrhage, Annals Surg., 155: 794-805, May, 1962.

8. Palmer, Eddy: Diagnosis of Upper Gastrointestinal Hemorrhage, Charles C Thomas, Springfield, Ill., 1961.

9. Quinn, W. C.: Gross hemorrhage from presumed diverticular disease of the colon, Ann. Surg., 153:851, 1961.

10. Ransom, H. K.: Diverticulitis of the colon, Gastroenterology, 26:12, 1954.

11. Rowe, R. J., and Kollmar, G. H.: Diverticulitis of the colon complicated by carcinoma, Intl. Abst. Surg., 94:1, 1952.

12. Scarborough, R. A.: The significance of rectal bleeding in diverticulosis and diverticulitis of the colon, Dis. Colon & Rectum, 1:49, 1958.

13. Stone, H. B.: Large melena of obscure origin, Ann. Surg., 120:582, 1944.



The Effects of Dextrothyroxine in Diabetes

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■ *Eighteen diabetic patients were treated with dextrothyroxine (from 2 mg to 8 mg daily) for varying periods up to six months. This produced a decided reduction of serum cholesterol levels. Statistically valid comparisons were made of their fasting blood sugar levels before and after two weeks of dextrothyroxine treatment. Administration of this drug was associated with a significant elevation of fasting blood sugar levels. Good diabetic control did not preclude this adverse effect.*

After more prolonged treatment with the drug, 8 of the 18 patients experienced progressive deterioration of their diabetic control, necessitating increased amounts of insulin or oral drugs. Despite close observation, one patient developed acidosis.

When dextrothyroxine was discontinued, there was a significant drop in blood sugar levels in these patients. Two patients had hypoglycemic reaction.

When the fasting blood sugar values of the 18 patients, studied while they were receiving significant doses of dextrothyroxine, are compared with a control series of blood sugar determinations obtained on these same patients before dextrothyroxine administration was begun, the diabetogenic effect of this drug is confirmed by the highly significant difference demonstrated.

Four patients were given dextrothyroxine a second time, and again experienced deterioration of diabetic control.

THE CLINICAL USEFULNESS of dextrothyroxine in depressing serum cholesterol levels has been well established.[26] Dock commented that "thyroid extract and, even more often, dextrothyroxine may be very effective in altering lipid levels at doses which cause no rise in heat production and no angina even in coronary disease. Both cause more symptoms at high dosage in myxedematous than in euthyroid subjects."[5]

From the Good Hope Medical Foundation and the University of Southern California, Los Angeles.

Submitted April 23, 1964.

However, several reports indicate that the cholesteropenic effects of dextrothyroxine cannot always be dissociated from the drug's undesirable effects on the cardiovascular system. Jones and Cohen[12] noted considerable hypocholesterolemic effect after 4 to 8 mg of dextrothyroxine per day, but said that cardiovascular complications such as angina and congestive failure occur frequently, and that dextrothyroxine "should best be reserved for patients free of cardiac symptoms." Other investigators reached similar conclusions.[4,10,30]

It is not, however, generally recognized that in

patients with hypercholesteremia and diabetes, the untoward influence of dextrothyroxine on carbohydrate metabolism must be considered. Some investigators have rejected or have failed to mention the concept of worsening diabetic control with the use of dextrothyroxine.[9,17,19,20,27] Occasional reports of isolated cases of glycosuria and hyperglycemia attributed to dextrothyroxine have appeared.[3,24,30] Cochran and associates noted that while dextrothyroxine usually lowered serum cholesterol concentration, it provoked decided hyperglycemia and ketonuria in 10 of 39 subjects.[2] Thyroxine analogues such as tri-iodothyropropionic acid and others can have similar effects on control of diabetes.[2,23] The present study was conducted to clarify further the effect of dextrothyroxine on carbohydrate metabolism.

Method and Materials

Eighteen patients with diabetes mellitus, who had regularly attended the diabetic clinic at the Good Hope Medical Foundation for several years, were given increasing dosages of dextrothyroxine for various lengths of time. The group consisted of 12 women and six men, ranging in age from 32 to 69 years. Except for two in whom the disease could be called "labile," all the patients had stable, maturity-onset diabetes. Ten patients had heart disease of various kinds. However, they had been asymptomatic for at least six months at the time this study was begun. Their past histories revealed three occurrences of angina, one myocardial infarct, one incidence of congestive failure and two operations to correct peripheral vascular complications.

During a two-month control period before the administration of dextrothyroxine, the highest fasting blood sugar level in this group was 182 mg per ml and the lowest was 70 mg per ml. No changes of insulin dosage or oral hypoglycemic agents became necessary during this period. In one patient diet alone was sufficient for control of diabetes, in eight the disease was controlled by oral hypoglycemic agents, and the rest used insulin. None of these patients had ever been in diabetic coma, had acidosis or hypoglycemia during several years of clinic observation. The patients were kept on an isocaloric diet. The fasting serum cholesterol levels in these patients ranged from 181 mg per ml to 506 mg per ml, and protein-bound iodine levels (PBI) during this two-month control period ranged from 4.5 to 8.2 microgram per ml. All patients were clinically euthyroid.

After this two-month control period, each patient received 2 mg of dextrothyroxine daily for two weeks, then 4, 6 or 8 mg of this drug daily as tolerated.

The patients visited the clinic every two weeks during this study. At each visit careful inquiry was made about the presence or occurrence of cardiovascular or any other side effects, and the blood pressure, pulse and body weight were determined. Fasting blood sugar (both the Folin-Wu and the true glucose method in parallel), PBI and fasting cholesterol were taken each time. The bi-weekly PBI determinations in these patients served as convenient monitors, showing that they had actually taken the prescribed dose of dextrothyroxine. With the 8 mg dose of the drug, PBI levels of 18 micrograms per ml or higher could be expected.

During the course of the study a total of 203 observations of this type was made on these 18 patients.

Four of these patients were given dextrothyroxine under identical conditions a second time, to ascertain whether the observed effects of the drug could be demonstrated again. In two patients this repeat treatment was started four weeks after the previous course of dextrothyroxine was discontinued; in the other two, the drug was started two years after the first treatment period.

Results

As expected, administration of dextrothyroxine reduced the serum cholesterol concentration and elevated the PBI level (Chart 1). There was also a

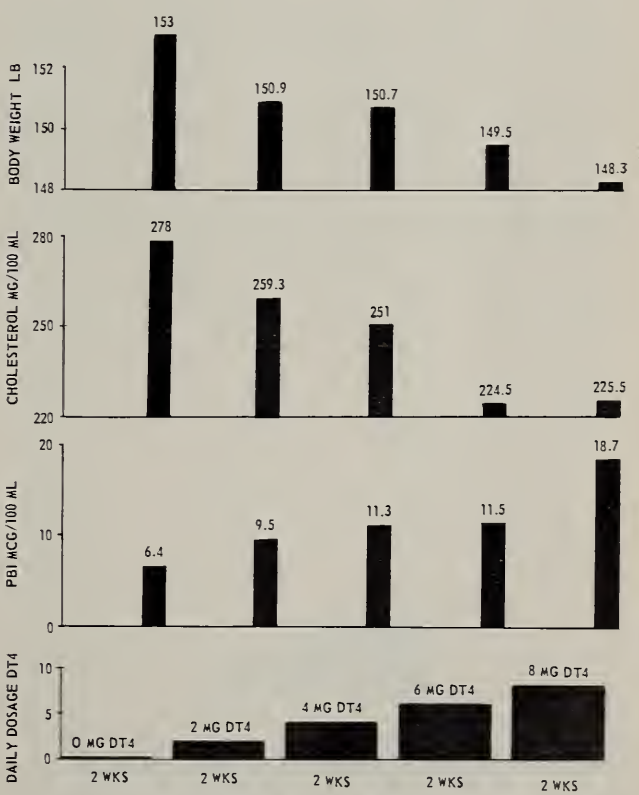


Chart 1.—Average elevation of serum PBI concentration and average reduction of serum cholesterol concentration and of body weight after administration of various daily doses of dextrothyroxine. (DT4 = Dextrothyroxine.)

TABLE 1.—*Analysis of the Effects of Two Weeks' Treatment of Various Doses of Dextrothyroxine on Fasting Blood Sugar Levels**

Change of dosage of DT4	Number of comparisons	FBS averages: Low dosage	FBS averages: High dosage	Mean difference	S.E. of mean difference	t	p	
0 to 2 mg	9	126	135	8.89	10.4	0.855	>0.4	NS
0 to 4 mg	19	131.1	172	41.05	14.39	2.85	<0.05	S
4 to 8 mg	14	176.2	191.6	15.43	8.32	1.85	>0.05	NS
0 to 4, 6 or 8 mg	20	128	167	39.2	13.1	2.99	<0.01	S

DT4 = Dextrothyroxine
FBS = Fasting blood sugar
S.E. = Standard error
NS = Not significant
S = Significant
* = Folin-Wu values

significant loss of body weight. The weight loss needs to be emphasized, because according to Gaffney and associates[8] it represents a more sensitive index of metabolic activity than the basal metabolic rate.

For statistical evaluation ("Student's 't' test for paired data") of the effects of dextrothyroxine on fasting blood sugar, we selected those occasions when the patient received this drug without any change in insulin dosage or oral drug requirements, and without development of complications (such as cerebral thrombosis) which might affect blood sugar levels. In each patient meeting these conditions, we utilized for comparison the last fasting blood sugar determination before the start of dextrothyroxine therapy and the first fasting blood sugar following two weeks of treatment with the indicated dose of the drug. Table 1 demonstrates that the minimum dose of dextrothyroxine necessary for a diabetogenic effect is 4 mg after two weeks of treatment. Doses of 6 or 8 mg were not significantly more active in this respect. Therefore pretreatment blood sugar levels could be compared with blood sugar levels after the first two weeks of treatment with either 4, 6 or 8 mg of dextrothyroxine (Table 1). The individual responses of 18 patients to two weeks of treatment with dextrothyroxine (4, 6 or 8 mg) are tabulated in Table 2. It is demonstrated that dextrothyroxine raises fasting blood sugar levels of patients regardless of their prior diabetic control. This contrasts with observations made by Searcy and associates who suggest that dextrothyroxine may have this adverse effect only in poorly controlled diabetics.[25] This is also substantiated by Chart 2, which graphically indicates the course of a patient with mild diabetes that was well controlled before dextrothyroxine was administered and his subsequent unfavorable experience with increasing doses of this drug.

In evaluating Table 2, it should be considered that in some cases, dextrothyroxine administered beyond a two-week period such as that shown on the chart, elevated the fasting blood sugar to much higher levels, completely unbalancing the previously maintained diabetic control and necessitating an increase in insulin dosage. At the same time, cholesterol levels dropped further, PBI values increased and the weight loss continued (Chart 2). In spite of diligent attempts to control the diabetic state, acidosis developed in another patient, along with evidence of subendocardial ischemia or infarction. On admission to hospital the blood sugar content in that patient was 395 mg per 100 ml and the urine showed a two-plus reaction for acetone. Eight of the 18 patients showed extreme elevations of fasting blood sugar values. However, some patients showed only slight fluctuations throughout without exhibiting any diminished reactivity in the other factors under study (PBI, cholesterol, weight, basal metabolic rate (Chart 3)).

When dextrothyroxine was discontinued in all 18 patients participating in this study, the fasting blood sugar dropped to pretreatment levels. Again due to variations in insulin dosage, only 14 two-week periods were available for statistical comparison of fasting blood sugar levels of patients receiving 8 mg of dextrothyroxine with their fasting blood sugar levels two weeks after the drug was discontinued. Table 3 shows the order of significance for this comparison.

TABLE 2.—*Individual Responses (Fasting Blood Sugar*) of Patients to Two Weeks' Treatment with Dextrothyroxine (4, 6 or 8 mg Daily)*

Patient	Before Therapy	4-8 mg Daily	Difference
1	182	240	+ 58
2	142	208	+ 66
2a†	114	292	+178
3	125	173	+ 48
4	120	132	+ 12
5	160	200	+ 40
6	105	310	+205
7	114	154	+ 40
7a†	109	118	+ 9
8	70	179	+109
9	119	137	+ 18
10	144	140	− 4
11	165	136	− 29
12	109	120	+ 11
13	120	154	+ 34
14	123	108	− 15
15	172	166	− 6
16	114	126	+ 12
17	140	136	− 4
18	120	128	+ 8
Average	128.4	167.9	+ 39.5

*Folin-Wu values.
†Second course of treatment.

TABLE 3.—*Analysis of Effects of Discontinuing Dextrothyroxine (8 mg Daily) on Fasting Blood Sugar Levels**

Change of dosage of DT4	8 to 0 mg
Number of patients	14
FBS averages	
High dosage	183.9 mg/100 ml
Zero dosage	124.0 mg/100 ml
Mean difference	59.86
S.E. of mean difference	25.78
t	2.32
p	<0.05
	Significant

DT4 = Dextrothyroxine
FBS = Fasting blood sugar
S.E. = Standard error
* = Folin-Wu values

TABLE 4.—*Comparison of Blood Sugar Values of Controls and Treated Patients*

	Dosage of DT4	
	0 mg	*4, 6 or 8 mg*
FBS averages*	140.4	169.9
Number of observations	237	112
Standard error	2.37	5.40
t	5.4	
p	0.001	
	Significant	

* = Fasting blood sugar, Folin-Wu values
DT4=Dextrothyroxine

Two patients had hypoglycemic reactions when dextrothyroxine was discontinued before proper adjustment of their insulin dosage was made at their next bi-weekly clinic visit.

Further follow-up after dextrothyroxine was discontinued disclosed that insulin requirements fell 44 per cent and oral drug requirements dropped 13 per cent on the average in the eight patients who had needed additional insulin with dextrothyroxine administration.

Although no double-blind studies are available, we were able to compare all the fasting blood sugar values of these 18 patients while they were receiving 4, 6 or 8 mg of dextrothyroxine with all their previous blood sugar determinations since their very first clinic visit before this drug was administered to them. The high order of significance of this comparison in Table 4 is due to the cumulative effect of dextrothyroxine treatment. It should be mentioned that these patients were treated by the same physicians and the same effort toward good diabetic control was maintained throughout.

As was previously mentioned, four patients were treated with dextrothyroxine a second time. All four again had increases in blood sugar almost identical with those that occurred the first time, and diabetic control deteriorated.

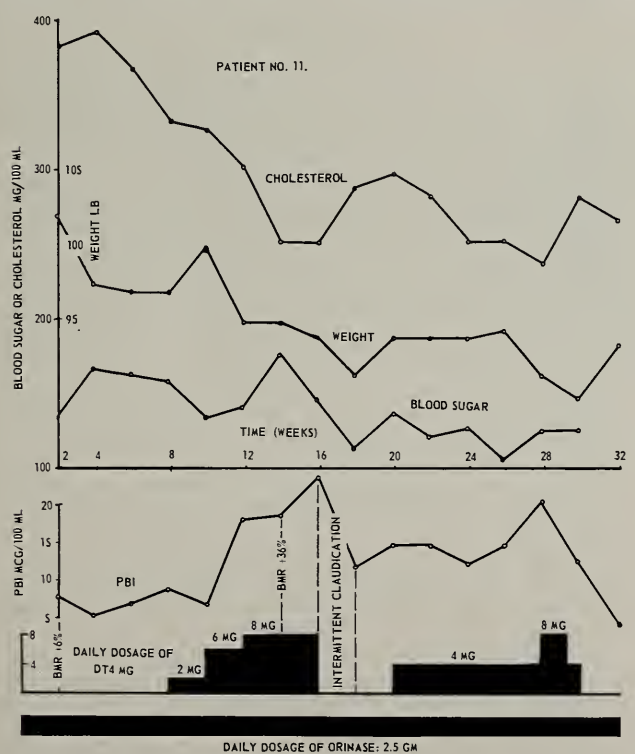


Chart 2.—Pronounced impairment of carbohydrate metabolism during dextrothyroxine administration, associated with weight loss and auricular fibrillation. (DT4=Dextrothyroxine.)



Chart 3.—Slight impairment of carbohydrate metabolism during dextrothyroxine administration, associated with weight loss, increased basal metabolic rate and intermittent claudication. (DT4=Dextrothyroxine.)

Eleven of the 18 patients experienced some cardiovascular complication while receiving dextrothyroxine therapy. These consisted of sudden onset of auricular fibrillation, cerebral thrombosis, subendocardial ischemia, intermittent claudication, exertional dyspnea, pulmonary congestion and right heart failure with liver enlargement and ankle swelling.

Discussion

The effect of thyroid hormones on diabetes has been thoroughly discussed by Houssay.[11] He showed that oral administration of thyroid extract could produce worsening of diabetes in dogs that had been made diabetic by partial pancreatectomy or by pretreatment with alloxan. He coined the term *thyroid diabetes* for the transitory diabetes that disappeared after administration of desiccated thyroid was discontinued, and *metathyroid* diabetes for the diabetes which persisted after thyroid administration was discontinued. He also observed that the length of the treatment was significant, and that thyroid extract produced definite histologic changes in the pancreas.

Before modern methods of treatment were known for diabetes and hyperthyroidism, the simultaneous occurrence of both diseases was considered catastrophic.[13] The relationship of the thyroid gland to diabetes and insulin was emphasized by Elgee and Williams, who demonstrated increased degradation of I^{131}-labeled insulin in rats by administration of thyroxin and tri-iodothyronine.[6] Administration of desiccated thyroid has been thought to increase absorption of glucose and particularly of galactose. In this study, the values of fasting blood sugar, as determined by the Folin-Wu method, were comparable with those by the true glucose method.

The direct effects of the thyroid hormones on carbohydrate metabolism are difficult to separate from the indirect effects due to their interaction with other hormones. In this respect, the interactions of thyroxin and epinephrine appear "intimately related to activity of the adrenergic nervous system or tissue catecholamine content or both,"[8] leading secondarily to glycogenolysis and hyperglycemia.

When given orally, dextrothyroxine has less calorigenic effect than does the levo isomer. The ratio has been estimated at 1:10 or less.[18,21,28] On the other hand, it has greater cholesteropenic effect than levo-thyroxine, judged by reduction of blood and liver cholesterol.[1,14] Both isomers cause swelling of the mitochondria and "uncouple" or "loose couple" oxidative phosphorylation, as reported by various investigators.[15,16,29] As compared with levo-thyroxine, dextrothyroxine's relative absence of calorigenic action has been explained by its faster disappearance from the serum.[7]

The difference between the two isomers (levothyroxine and dextrothyroxine) thus appears to be quantitative only. According to recent studies by Pitman and Barker,[22] the uptake of dextrothyroxine in the heart, diaphragm, liver and kidney of experimental animals differs in no unique way from that of levo-thyroxine, although dextrothyroxine has less calorigenic effect overall. Consequently, a proportionately smaller but still considerable influence of dextrothyroxine on carbohydrate metabolism can be expected.

The potentiating effect of cardiovascular complications on diabetes is well known. Therefore a special effort was made in this study to demonstrate that the adverse effect of dextrothyroxine on diabetic control is a primary phenomenon; and that it occurs in the absence of cardiovascular complications as demonstrated in the comparisons of Tables 1 and 2.

It can be concluded that while significant depression of the serum cholesterol level can be expected from dextrothyroxine in diabetic patients, careful supervision of their diabetic state is indicated with the use of this drug.

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REFERENCES

1. Best, M. M., and Duncan, C. H.: Effect of D-thyroxine on cholesterol metabolism in the rodent, in Symposium on Sodium D-Thyroxine and Hypercholesterolemia, 88 pp., Baxter Laboratories, Chicago, 1960, p. 35.

2. Cochran, B., Kinnory, D. S., Marbach, E. P., and Pote, W. H. Jr.: Personal communication and paper read as abstract at Southern California regional meeting, American College of Physicians, Coronado, February, 1963.

3. Cohen, B. M.: One year of sodium dextrothyroxine therapy for hypercholesterolemia, Angiology, 13:69, 1962.

4. DeGraff, A. C.: Appraisal and reappraisal of drugs used in the treatment of heart conditions, Amer. Heart J., 65:131, 1963.

5. Dock, W.: In Principles of Internal Medicine (Fourth Edition), edited by T. R. Harrison, 1947 pp., McGraw-Hill Co., New York, 1962, p. 1364.

6. Elgee, N. J., and Williams, R. H.: Effects of thyroid function on insulin-I^{131} degradation, Amer. J. Physiol., 180:13, 1955.

7. Freinkel, N., Ingbar, S. H., and Dowling, J. T.: The influence of extracellular thyroxine-binding protein upon the accumulation of thyroxine by tissue slices, J. Clin. Invest., 36:25, 1947.

8. Gaffney, T. E., Braunwald, E., and Kahler, R. L.: Effect of guanethidine on tri-iodothyronine-induced hyperthyroidism in man, N.E.J.M., 265:16, 1961.

9. Green, R., Pearce, J. F., and Rideout, D. F.: Effect of D-thyroxine on serum cholesterol, Brit. Med. J., 1:1572, 1961.

10. Hoobler, S. W., Colwell, C. W., and Beierwaltes, W. H.: D-thyroxine in the treatment of hypercholesterolemia, J. Mich. Med. Soc., 59:1704, 1960.

11. Houssay, B. A.: The Thyroid and Diabetes, in Vitamins and Hormones (Fourth Edition), edited by R. S. Harris and K. V. Thimann, 406 pp., Academic Press, New York, 1946, p. 187.

12. Jones, R. J., and Cohen, L.: Sodium dextro-thyroxine in coronary disease and hypercholesterolemia, Circulation, 24:164, 1961.

13. Joslin, E. P., Root, H. F., White, P., and Marble, A.: The Treatment of Diabetes Mellitus (Seventh Edition), Lea & Febiger, Philadelphia, 783 pp., 1940, p. 653.

14. Kritchevsky, D., and Langan, J.: Effects of D- and L-thyroxine in experimental atherosclerosis in the rabbit, in Symposium on Sodium D-Thyroxine and Hypercholesterolemia, 88 pp., Baxter Laboratories, Chicago, 1960, p. 39.

15. Lehninger, A. L.: Thyroxine and the swelling and contraction cycle in mitochondria, Ann. N.Y. Acad. Sci., 86:484, 1960.

16. Maley, G. F., and Lardy, H. A.: Metabolic effects of thyroid hormones in vitro, J. Biol. Chem., 204:435, 1953.

17. McCullagh, P., and Sylvester, J.: Data on reversal of hypercholesterolemia in non-hypothyroid states, in Symposium on Sodium D-Thyroxine and Hypercholesterolemia, Baxter Laboratories, Chicago, 82 pp., 1960, p. 67.

18. Oliver, M. F., and Boyd, G. S.: Comparative Effects of Thyroxine Analogues in Patients with Coronary Heart Disease, in Derivatives and Isomers of the Thyroid Hormones, edited by M. L. Sachs, University of Pennsylvania School of Medicine, Philadelphia, 88 pp., 1960, p. 71.

19. Owen, W. R., Owens, J. C., and Neely, W. G.: Objective effects of dextrothyroxine therapy, Angiology, 32:75, 1962.

20. Owen, W. R.: Effect of sodium D-thyroxine on serum cholesterol in man, Medicine et Hygiene, 506:462, 1961.

21. Pitt Rivers, R., and Lerman, J.: The physiological activity of the optically active isomers of thyroxine, J. Endocr., 5:223, 1948.

22. Pittman, C. S., and Barker, S. B.: The calorigenic effects of some thyroid analogs on intact animal and excised tissues, J. Clin. Invest., 41:696, 1962.

23. Rawson, R. W.: Analogues and derivatives of thyroxine, in Advances in Internal Medicine (Volume Eleven), edited by W. Dock and I. Snapper, Year Book Publishers, New York, 332 pp., 1962, p. 229.

24. Schneeberg, N. G., Herman, E., Menduke, H., and Altschuler, N. K.: Reduction of serum cholesterol by sodium dextro-thyroxine in euthyroid subjects, Ann. Intern. Med., 56:265, 1962.

25. Searcy, R. L., Craig, R. G., Giddings, J. A., and Bergquist, L. M.: Treatment of hyperlipemic diabetic patients, Calif. Med., 99:12, 1963.

26. Starr, P., Roen, P., Freibrun, J. L., and Schleissner, L. A.: Reduction of serum cholesterol by sodium dextro-thyroxine, A.M.A. Arch. Intern. Med., 105:830, 1960.

27. Starr, P.: Reduction of serum cholesterol by sodium dextro-thyroxine, in Symposium on Sodium D-Thyroxine and Hypercholesterolemia, Baxter Laboratories, Chicago, 82 pp., 1960, p. 49.

28. Starr, P., and Lepp, A.: Studies of sodium D-thyroxine, in Derivatives and Isomers of the Thyroid Hormones, edited by M. L. Sachs, University of Pennsylvania School of Medicine, Philadelphia, 88 pp., 1960, p. 49.

29. Tapley, D. F.: The effect of thyroxine and other substances on the swelling of isolated rat liver mitochondria, J. Biol. Chem., 222:325, 1956.

30. Taxay, E. P.: Clinical evaluation of a thyroid analog in patients with hypercholesterolemia, angina, claudication and diabetes, Amer. J. Med. Sci., 244:196, 1962.



Smoking by High School Students

Failure of a Campaign to Persuade Adolescents Not to Smoke

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King City

AN EDUCATIONAL CAMPAIGN aimed at dissuading students from smoking was conducted by two volunteer physicians at King City Joint Union High School in a five-year period ended December 31, 1964. At the end of the period the proportion of smokers was greater than at the beginning.

Arrangements for the campaign, which entailed instruction at the school by the two physicians, were made by a member of the administrative department of the school.

Each year for the five years, six 50-minute periods of instruction on the effects of smoking were given during a two-week period to the freshman class. The first five periods were devoted to classroom instruction through lecture and the showing of motion pictures. One of the physicians spoke on pharmacologic features of tobacco and the increased incidence of various disease processes in smokers. The other physician spoke on the reason for smoking, stressing the social, cultural and psychological factors involved in children's starting to smoke. The subject was presented with emphasis on the health factor rather than on laws regarding smoking by minors. Judging by their attention and the many questions asked during the discussion period, the students appeared to be genuinely interested. In addition there was good community interest, as evidenced by newspaper coverage and presentations at community functions. This, we had hoped, would reinforce the effectiveness of the program.

Submitted July 2, 1963.

TABLE 1.—*Data on Smoking by Junior and Senior High School Students in the United States Compared with Data for King City High School**

	Percentage Who Smoke		
	Boys	*Girls*	*Total*
Institute of Student Opinion, 1960†..	28.1	14.5	21.0
King City 1960-61	36.7	15.8	27.6
King City 1962-63	48.9	20.4	33.5
King City 1963-64	63.5	19.1	40.3

*Data at King City High was reviewed by a committee of students picked by the school administration and considered representative of various segments of the classes.

†Results of a national poll of 10,763 junior and senior high school students.

King City, located in Southern Monterey County, an agricultural area, serves a radius of approximately 25 miles. The population of the town is about 3,000 and the total population from which the high school draws students is approximately 10,000. The high school student body comprises 550.

By a national poll of 10,763 junior and senior high school students from all sections of the United States, the Institute of Student opinion concluded in 1960 that 21 per cent smoked. From answers to a health questionnaire distributed to students of the same age in the King City High School, we found that 27.6 per cent smoked in 1960, 35.5 per cent in 1962 and 40.3 per cent in 1963 (Table 1).

There was a constant increase in the proportion of smokers over the last three years (Tables 1 and 2), which led to the conclusion that our present program of dissuasion is inadequate.

Certainly there is a complexity of recognized factors (and perhaps many unrecognized) in our failure to change the smoking habits amongst King City High School students. One is that, in the period covered by our campaign, the tobacco industry had an intensive advertising campaign aimed at young people. Another is that children probably are in-

TABLE 2.—*Data on Smoking by Students of Freshman, Sophomore, Junior and Senior Classes for Three Years 1961-64*

	Per Cent Who Smoke			
	Freshman	*Sophomore*	*Junior*	*Senior*
King City 1960-61	17.3	20.9	37.7	38.3
King City 1962-63	27.8	24.2	45.8	38.9
King City 1963-64	30.3	33.5	36.8	44.4

TABLE 3.—*Percentage of Smokers in Sixth, Seventh and Eighth Grades of Grammar Schools in King City High School District*

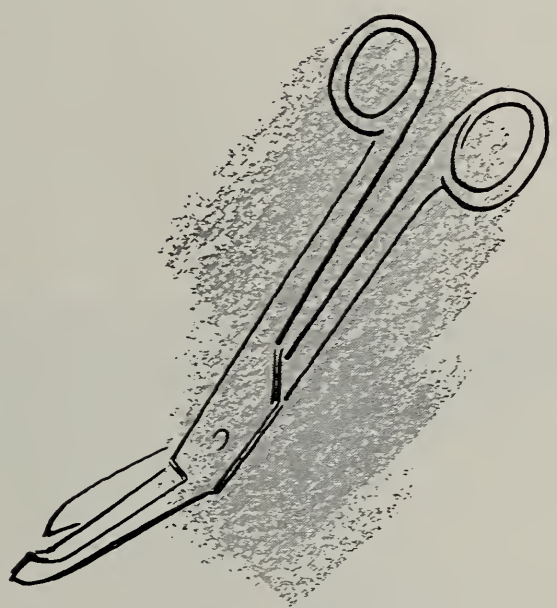
	Per Cent Who Smoke		
	Boys	*Girls*	*Totals*
Sixth Grade (187 total)	4.0%	0%	2.1%
Seventh Grade (176 total)	2.2	0	5.5
Eighth Grade (174 total	16.2	12.5	14.4

fluenced by teachers, clergymen, physicians and a large portion of the adult population who smoke. Probably most important is the influence of parents. In our study both parents of 37 per cent of smoking students smoked, and 46 per cent had at least one parent who smoked. Seventeen per cent had non-smoking parents.

Since there was an appreciable rise this year (1963-1964) in the incidence of smoking in our freshman group, we extended our survey of smoking to all the students in the sixth, seventh and eighth grades of the grammar schools (537 students) in the King City Joint Union High School District (Table 3).

Since it appears that our efforts in the King City High School to dissuade students from smoking are either inadequate in time spent or are of poor design, it is our opinion that additional effort must be directed at the younger pre-adolescent age group to deter their starting the smoking habit.

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Cryothalamectomy

For Parkinson's Disease

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CHARLES H. MARKHAM, M.D., *Los Angeles*

■ *In a review of 61 patients with Parkinson's disease who were treated by cryothalamectomy, the technique of freezing a surgical target as compared with destroying it by alcohol or thermal heat was found effective and to a degree safer than other techniques. One patient died of unexpected cerebral hemorrhage. Of patients considered excellent candidates for the operation, 80 per cent had excellent and good results, while those considered good candidates showed 85 per cent excellent and good results. The results are more dependent on the selection of the patient as a candidate and the diffuseness of the pathophysiological circuits involved than on the technical factors of the cryogenic procedure.*

OVER THE PAST DECADE it has been well established that a stereotaxically placed destructive lesion in the region of the nucleus ventralis lateralis of the thalamus is the treatment of choice in selected cases of Parkinson's disease. The surgical results of such procedures depend primarily upon the choice of the patient and the site of destruction.

The method of producing the lesion is also an important factor. In Europe, radio-frequency instruments and electrodes have been employed to produce thermocoagulation in the thalamus. A bipolar technique described by Svennilson and coworkers[11] or a monopolar method as outlined by Mundinger and Reichert[7] may be used. In this country, cerebral lesions have been produced by electrolysis, radio-frequency heat, mechanical loops and small amounts of absolute alcohol. More or less satisfactory results have been obtained with all of these techniques. Our experience with use of the balloon cannula and alcohol method as described by Cooper and Bravo[2] were recently summarized.[5] Results of 149 operations in 114 cases were excellent or good in 70 per cent of cases and mortality was less than 1 per cent.

In 1961 Tytus and Ries[12] described a freon cryogenic probe fashioned after those of Hass and

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Taylor[4] and Rowbotham and coworkers.[9] The latter system was used unsuccessfully in the treatment of malignant brain tumors. These investigators clearly demonstrated in experimental animals that discrete destruction lesions could be made in organs such as the liver, kidney, pituitary gland and brain. Cooper and Lee[3] achieved better insulation of the shaft of the probe by using a silk wrapping and they substituted liquid nitrogen as the cooling agent. More recently, the Linde* cryoprobe incorporating vacuum insulation has permitted still lower temperatures at the tip of the probe.

Since 1962, the authors have performed cryothalamectomy procedures[1] on 61 patients with Parkinson's disease and an additional nine with such conditions as dystonia musculorum deformans, choreoathetosis and torticollis. In 51 cases the lesions were made with the Cooper-Lee system and in ten with the Linde unit.

Methods

The Rand-Wells stereotaxic guide† was used in all operations to direct the stimulating electrode and cryogenic probe to the proposed surgical target under x-ray control.[8] The patients were operated upon under local anesthesia with an anesthesiologist present. In the earlier cases in the series a pneumoencephalogram was performed at the beginning of operation, using the fractional displacement technique and instilling approximately 40 ml of filtered air. The patient was then immediately placed in a supine position and his head fixed rigidly in the Lee cassette-holder‡ under sterile conditions and local anesthesia. Now we use positive ventriculography with Conray,®§ which gives better delineation of the anatomical landmarks. Using the pin fixation head-holder allows for reproduction of anterior-posterior and lateral films throughout the operation. Usually the film target distance was 36 inches for the anterior-posterior and 40 inches for the lateral view. At times, the lateral films were taken at 4 meters (teleroentgenography) to eliminate magnification. Millimeter measurements made on these films could be transferred directly to the stereotactic instrument and cryoprobe (Figure 1).

The stereotaxic guide was screwed securely to the skull over an appropriately placed frontal burr hole on the side opposite the most severely affected limbs. After the initial films, final corrections on the coronal and saggital arc systems were made. The cryogenic probe was then inserted to a depth of 6.5 cm and additional films were taken. From these, the final depth was determined; usually it varied from 6 to 7 cm from the surface of the cortex, depending upon the individual brain size and anatomical variations of the thalamic targets. The probe tip was generally placed 15 to 18 mm behind the foramen of Monroe and 15 to 20 mm to the right or left of the midline (Figure 1). Variations of these meas-

*Linde Corporation, Union Carbide Company, Indianapolis, Indiana.
†Mechanical Developments, Inc., South Gate, California.
‡Invengineering, Inc., Belmar, New Jersey.
§®Conray (Meglumine iothalamate 60 per cent) Mallinckrodt Pharmaceuticals, St. Louis, Missouri.

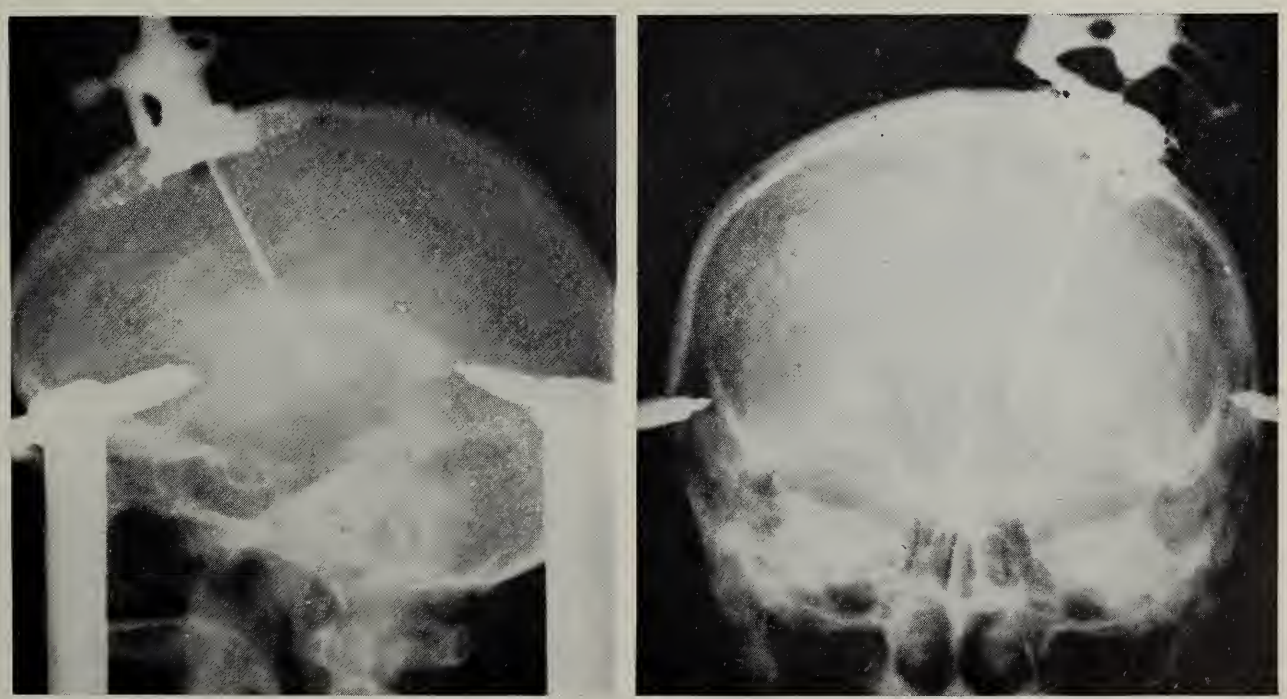


Figure 1.—Lateral and anterior-posterior views showing Linde cryogenic probe held in the Rand-Wells guide, with the probe tip in the region of the thalamic nucelus ventralis lateralis.

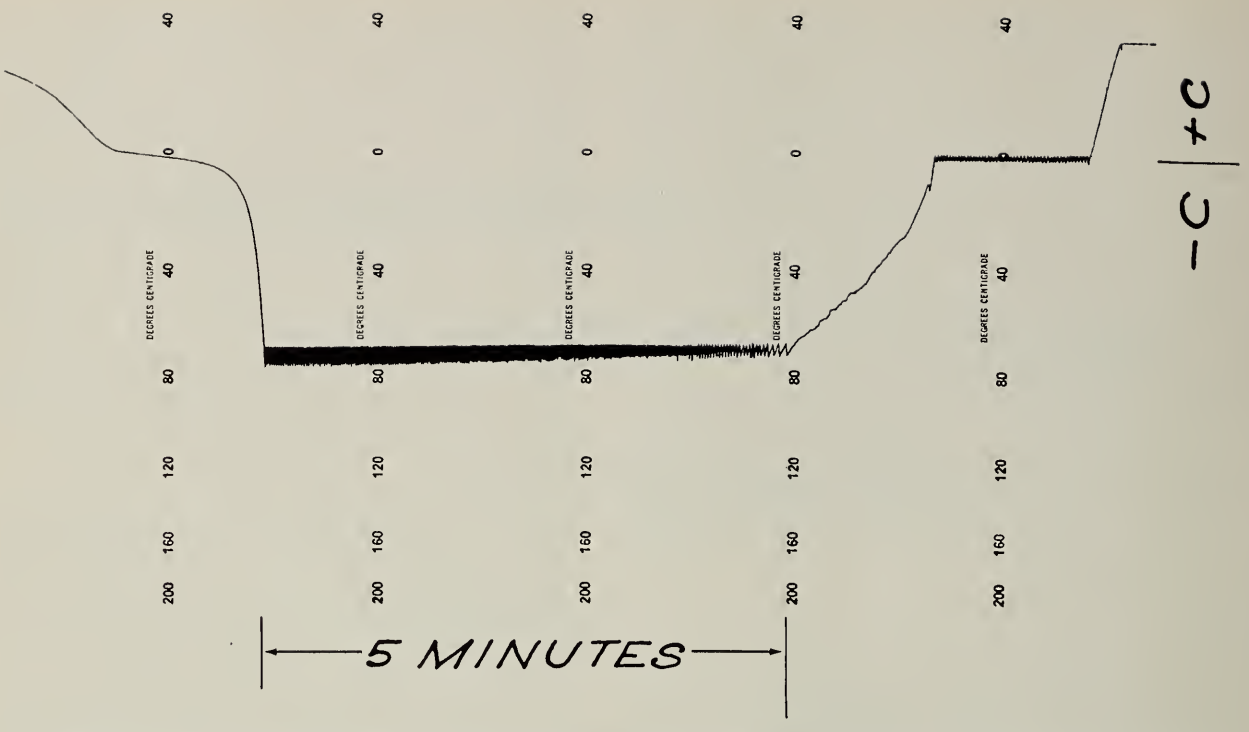


Figure 2.—Graph of the temperature at the tip of the Linde probe, showing method by which a lesion is produced at minus 70° for 5 minutes. Read the graph from right to left.

urements depended upon individual estimation of the position of the nucleus ventralis lateralis as determined on the x-ray film.

The temperature at the cryoprobe tip was lowered to zero degrees centigrade for a period of 15 to 60 seconds to observe any adverse or beneficial effect. Frequently, the simple introduction of the cryoprobe or an electrode into the thalamic target reduced or virtually obliterated the rigidity and tremor on the opposite side. If no adverse effects such as difficulty of speech, diminished strength, sensory changes or confusion were noted, the temperature was further lowered gradually to the range of minus 50 degrees centigrade with the Lee probe and between minus 60 to minus 70 degrees centigrade with the Linde probe (Figure 2). The duration of the freezing was dependent on previous experimental observations of lesion size (Figure 3) and on the clinical effects.

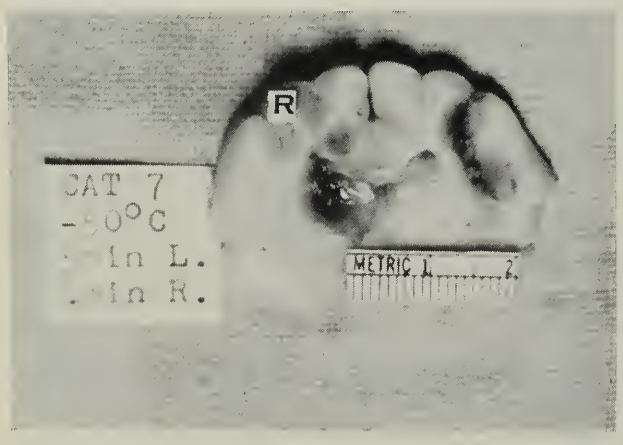


Figure 3.—Cryogenic lesion in the brain of a cat. The animal was sacrificed immediately after the lesion was made. Note the sharp boundary between the 8 mm lesion and the surrounding brain.

At times the patient would tolerate only one or two minutes of the cryogenic lesion before some minor abnormal neurological finding developed. At other times the lesion was enlarged over a period of seven minutes in an effort to obtain the desired clinical response. Occasionally it was necessary to make two, three or even four lesions in the lateral thalamus.

If any adverse symptoms began to develop while the lesion was being produced, the flow of liquid nitrogen through the cryoprobe was immediately discontinued and the temperature permitted to rise to normal levels. In most instances, the abnormal neurological signs immediately regressed, presumably because of the physiological reversibility at the periphery of the cryogenic lesion. It has been shown by several investigators in experimental animals that a degree of reversibility is present at the periphery of the cryogenic lesion.[10]

At times capillary hemorrhages do occur within the lesion, as has been shown by Hass and Taylor[4] and Miyazaki and coworkers[6]. Microscopic studies of experimental lesions observed several weeks after

production have demonstrated a sharp demarcation between normal and necrotic cerebral tissue. In a large series of cats and dogs the authors have made freezing lesions with the Lee or Linde cryoprobes in the subcortex and basal ganglia and have studied the results at the time of the experiment and over the succeeding weeks. The sizes of the lesions were correlated with the temperature. Lesions made at 0° centigrade to minus 25° centigrade were variable in size and shape. Small vessels 2 to 3 mm from the tip of the probe often had normal nerve cells surrounding them. Lesions made in the subcortex and basal ganglia at minus 40° centigrade and lower were more predictable in both size and shape than those made at minus 40° to minus 60° centigrade in highly vascular areas such as pituitary gland.

Symptoms such as dysarthria or weakness of the muscles of the extremities or the face, always indicate capsular involvement. Choreiform movements or loss of postural tone suggest subthalamic involvement. Complaints of paresthesias suggest encroachment on the sensory relay nuclei. A relaxation of concern or even euphoria usually indicates involvement of the medial thalamic nuclei.

Results

The patients were classified as excellent, good, fair or poor candidates:

Excellent if parkinsonian symptoms of tremor and rigidity virtually were confined to one side with no other severe physical defects and without intellectual impairment;

Good if they had moderate to severe tremor and/or rigidity bilaterally with mild bradykinesia and little or no loss of memory;

Fair if they had at least several of the following: moderate bradykinesia, some difficulty in recent memory, speech problems manifested by low volume and/or mild slurring or rushing of speech toward the end of a sentence, slight pyramidal signs;

Poor if they had further exaggeration of the symptoms noted above. (None of this classification was operated upon in the current series.)

Results were also of four categories:

- *Excellent* meant that the patient returned to work or normal activity for his age, was tremor-free (or occasionally had mild transient episodes of tremor with emotion); that the rigidity was a 90 to 100 per cent improvement and that there was no impairment of speech or mentality.

- *Good* means that the patient was tremor-free except for mild episodes during emotional crisis and fatigue, that rigidity was 75 to 90 per cent improved and that the patient would be independent with respect to personal care and have no mental impairment.

- *Fair* meant that the patient showed persistent or recurrent mild tremor, had 50 to 75 per cent improvement of rigidity and required some help in personal care.

- *Poor* meant there was recurrence or persistence of rigidity and/or tremor with increase in bulbar signs or permanent mental impairment.

Roentgenograms of all of the patients in this series were reviewed and the observed position of the cryoprobe tip with relationship to the foramina-pineal line was correlated with the result of operation. The tip was slightly behind the mid-portion of the line in patients who had excellent and good results. Specifically, the ratio of the length of the foramina-pineal line to distance from the probe tip to the foramen of Monroe was 0.52 to 1 in patients with excellent results and also in those with good results. For patients with excellent results, the maximum ratio was 0.94 to 1 and the minimum ratio was 0.52. For those with good results the maximum ratio was 0.57 to 1 and minimum ratio 0.49 to 1. The ratio of the lateral ventricle width to the probe tip distance from the midline averaged 0.75 to 1 for patients with good results and 0.78 to 1 for patients with excellent results. Similar localization ratios were found in patients with fair results.

Therefore, assuming that the foramina-pineal line was 30 mm, the initial surgical target would be approximately 16 mm behind the foramen, and if the lateral ventricle was 20 mm wide the target would be at least 15 mm from the midline. At times the lesions were made 2 or 3 mm above or below the foramina-pineal line in order to obtain the desired clinical response. At other times it was necessary to move the cryoprobe either laterally or medially, depending upon the clinical response and appearance of any abnormal neurological findings.

Past work by ourselves and other investigators has shown excellent or good results are likely to follow the making of lesions in the region of the nucleus ventralis lateralis and the centrum medianum. Yet, lesions made in the ventralis lateralis (as determined by x-ray, neurophysiological findings and clinical effect of lesion making) were not always effective on the parkinsonian rigidity and tremor. This was indicated in the present series in which single lesions made in the region of the nucleus ventralis lateralis (see the measurements above) produced, in different instances excellent, good or fair results. Further, minor variations in placement within the nucleus ventralis lateralis could not be correlated with the degree of success of the treatment. This data suggests the circuits in the nucleus

ventralis lateralis necessary for the maintenance of parkinsonian tremor and rigidity vary from patient to patient.

As to data on the number of lesions and the degree and duration of cold used to produce the lesions, it was found that in patients with excellent results from one lesion the average time was 3.8 minutes with an average temperature of minus 54° centigrade (18 cases). For an excellent result which required two lesions, the average time for each lesion was 3 minutes at minus 54° centigrade (13 cases). The patients with good results which required only one lesion had the cryogenic probe on for 3.4 minutes at an average of minus 55° centigrade (ten cases). With two lesions, each lesion was made on an average of 3.2 minutes at minus 50° centigrade (four cases). Thus, it can be seen that the time and temperature factors, whether for one lesion or two, were quite similar for the patients with excellent and good results.

One lesion was made in each of 33 patients, two in each of 22 patients, three lesions in five patients and four lesions in one patient. It was found that in 85 per cent of patients for whom one lesion brought about excellent or good results the quality of result did not deteriorate with time, while in only 75 per cent of patients with two or three lesions will excellent or good results endure. Thus, in patients we judged to be excellent or good candidates for success from the operation, there was a somewhat greater chance of a favorable outcome if ablation of the tremor and rigidity could be accomplished with one lesion in the nucleus ventralis lateralis rather than with several. This effect, and the variability of response to single lesions in the nucleus ventralis lateralis (see above) suggests considerable deviation in the degree and manner of participation of the nucleus ventralis lateralis in parkinsonian symptoms. The relative ineffectiveness of surgically produced lesions in "poor" and "fair" candidates (those with great rigidity and akinesia) also emphasizes the differences in the pathophysiological circuits involved in Parkinson's disease.

Of the neurological abnormalities that developed during operation, paresis, abnormal movements and the Babinski sign were seen slightly more than twice as often when two or more lesions were made than with one lesion. The incidence of slurring of speech was about the same with one lesion as with two or more, but mental confusion occurred slightly less with one lesion. As previously mentioned, the majority of these abnormal neurological signs either reversed during the procedure when the cryogenic probe was shut down or in the few days after operation with the subsidence of edema. Cerebral hemorrhage occurred on two occasions, once causing death and once resulting in severe paresis (which at last report was improving). Two patients were worse because of intellectual impairment. In one of these cases the complication occurred suddenly during operation, which suggested involvement of the fronto-thalamic projection pathways. In both instances the impairment gradually cleared.

Of ten patients who were excellent candidates, six had excellent results and two had good results. One had fair improvement and one died from a cerebral hemorrhage. Of 40 patients who were considered good candidates, 25 had excellent results, nine had good results, one had fair improvement, three had no improvement and two were worse because of intellectual impairment. Of 11 patients who were fair candidates, three had an excellent and three a good result. Four had a fair response and one was worse because of a cerebral hemorrhage. Thus, excellent and good results were obtained in 80 per cent of excellent candidates, in 85 per cent of the good candidates, and in 54 per cent of the fair candidates. This response was similar to that obtained in a previous series although a higher percentage of excellent results occurred in both the excellent and good candidate group and also in the fair candidate group.

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REFERENCES

1. Cooper, I. S.: A cryogenic method for physiologic inhibition and production of lesions in the brain, J. Neurosurg., 19:853, May 14, 1962.

2. Cooper, I. S., and Bravo, G.: Chemopallidectomy and chemothalamectomy, J. Neurosurg., 15:244, May, 1958.

3. Cooper, I. S., and Lee, A. St. J.: Cryothalamectomy—hypothermic congelation: A technical advance in basal ganglia surgery, J. Amer. Geriat. Soc., 9:714, Aug. 1961.

4. Hass, G. M., and Taylor, C. B.: Quantitative hypothermic method for production of local injury of tissue, Arch. Path., 45:563, 1948.

5. Markham, C. H., and Rand, R. W.: Stereotactic surgery in Parkinson's disease, Arch. Neurol., 8:621, June, 1963.

6. Miyazaki, Y., Ervin, F. R., Siegfried, J., Richardson, E. P., and Mark, V. H.: Localized cooling in the central nervous system: Part II. Histopathological results, Arch. Neurol., 9:392, Oct., 1963.

7. Mundlinger, F., and Riechert, T.: Die stereotaktischen hirnoperationen zur behandlung extrapyramidaler bewegungsstorungen (Parkinsonismus and hyperkinesen) und ihre resultate, Neurol. Psych., Jan., 1963.

8. Rand, R. W.: A stereotaxic instrument for Yttrium hypophysectomy, Bull L.A. Neurol. Soc., 24:224, Dec., 1959.

9. Rowbotham, G. F., Haigh, A. L., and Leslie, W. G.: Cooling cannula for use in treatment of cerebral neoplasms, Lancet, 1:12, 1959.

10. Siegfried, J., Ervin, F. R., Miyazaki, Y., and Mark, V. H.: Localized cooling of the central nervous system. J. Neurosurg., 10:840, Oct., 1962.

11. Svennilson, E., Torvik, A., Lowe, R., and Leksell, L.: Treatment of Parkinsonism by stereotactic thermolesions in the pallidal region, Acta Psych. et Neurol. Scan., 35:358, 1960.

12. Tytus, J. S., and Ries, L.: Further observations on rapid freezing and its possible applications to neurosurgical techniques, Bull. Mason Clinic., 15:51, June, 1961.

Parkinsonism

Evaluation and Treatment of Movement Disorders

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■ *Patients with movement disorders from parkinsonism were treated with thalamotomy performed by stereotactic surgical procedure. In order to determine with any degree of objectivity the results of these lesions, an accelerometer was used to record hand tremor and various mechanical tests were carried out that included self-care activities to evaluate impairment of function. On the basis of these tests, patients were selected for surgical operation, their condition before and after operation was evaluated, and a program for their rehabilitation was drafted.*

WITH THE ADVENT of stereotactic surgical procedures, the means of evaluating the condition of patients with parkinsonism have become more discerning, with greater emphasis being placed on objectivity.

Webster,[8] Boshes,[1] Burns[3] and Brumlik[2] used such aids as myographs, electromyography, accelerometers, strain gauges, motion movies and dynamometers for measuring tremor, rigidity and strength in the muscles at rest and during isolated movements of the extremities. England[4] and Schwab[5,6,7] combined these measurements with tests of performance —handwriting tests, the ability to draw triangles and circles, measuring the time a patient took to dress, wash and eat and observing aptitude in indoor and outdoor activities, occupational duties and chores. The timed tests were graded on a percentage basis.

The patients we deal with are studied in a similar manner. Immediately before, during and at some time after thalamotomy they are tested with a microminiature accelerometer weighing 2.75 grams that is attached to the involved finger, and a tracing is made

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Figure 1.—Tracing of finger tremor in Parkinson's disease. Tracings made before, during and immediately after operation are analyzed with regard to degree and rate of tremor and fine irregularities within the gross tremor. The stimulus consists of an electrical current of negative rectangular pulse of one millisecond duration and amplitude varying from 0.5 to 10 volts.

of the tremor (Figure 1). The tracing is analyzed as to degree and rate of tremor and the irregularities in the jerky motion within the gross tremor.

Tests for impairment of normal function also are done. Some of the activities that have to do with self-care are tested in occupational therapy, and others that include activities of daily living as well as gait and stairclimbing are tested in physical therapy.

In each case we chart data of four categories. Representing a preliminary protocol with results from simplified tests, these charts provide us with a gross evaluation of important functions arranged to facilitate a rapid analysis. Some of the charted data is based on actual timing of a performance, some on the configuration of a graphic record on paper and some on the investigator's interpretation of the patient's ability to perform certain actions. (See Charts 1, 2, and 3.

Chart 1 is a record of pertinent information about the patient, his age and the side of his brain that is operated upon. The patient's ability to coordinate his hands and arms is tested in a pegboard exercise, in bringing a cup or a spoon to his mouth, in cutting meat and in clashing cymbals. In these tests, tremor is usually the chief interfering factor, whereas in dressing and undressing, balance is important and rigidity becomes a factor. Almost all the patients have difficulty with buttoning and unbuttoning their clothes and with tying shoe laces. Measurement of reasoning is done by a simple psychological exercise to determine the presence of intellectual deterioration, emotional instability or loss of memory. These tests are done immediately before operation, a day or two after operation and again about two to three weeks later. If and when the patient is transferred to outpatient status, he is tested during follow-up visits, which may continue for months and years.

Chart 1 is also the form for reporting on the usual functions carried out by the patient for personal hygiene, such as washing his hands, brushing his teeth, combing his hair and shaving. Here the therapist makes comments about the patient's performance. As the patients are usually unable to make a to and fro rubbing motion while washing, they prefer to pat the face and neck with the washcloth. In brushing the teeth and in shaving, most patients prefer to use electric appliances. Any simulated or substituted motion to achieve the desired function should be described by the therapist. Speech function is based on the articulatory and the phonatory abilities of the patient, along with the correct coordination of breathing with phonation. A specimen of the patient's handwriting and of his ability to draw lines to connect points are useful for appraising tremor.

Chart 2 combines clinical impressions of tremor, rigidity, sialorrhea and other signs with a summary of the patient's performance in activities related to self care. The purpose of this form is to provide a quick over-all record on which to base postoperative assessment of activity.

Chart 3 is for recording the testing of functions that require movement of the entire trunk and extremities as required in the activities of daily living: ability to sit with and without support, to stand up from a chair, to walk, climb stairs or inclines and avoid obstacles, to coordinate hand and leg movements as when catching a medicine ball, and to respond to commands that may require the performance of two actions at the same time. For a patient with parkinsonism the latter is a difficult feat, for movements are usually carried out separately and in sequence rather than simultaneously.

The evaluation drawn from the charted information is of value in three ways: (1) for proper selection of patients for surgical procedures; (2) for the assessment of benefits from operation; and (3) for the establishment of guides in the planning of a rehabilitation program for the patient. In evaluating these patients, however, it is important to remember that they perform best when they are relaxed and in familiar circumstances. Conversely, their symptoms become aggravated and their performances are reduced when they are emotionally upset and tense and possibly embarrassed about their inadequacies.

The physical evaluation of a patient with parkinsonism presents only one facet of his dislocation from normal living habits. Social, psychological and vocational assessments are also carried out concurrently with the physical evaluation of the functional activities, and they play an important role in the establishment of a rehabilitation program for each patient. However, these factors will not be elaborated on here, since the purpose of this communication is to present our methodology in testing patients with parkinsonism from the standpoint of performance

CHART 1.—*Evaluation for Parkinson's Disease (Occupational Therapy)*

Name: Age:
Unit number: Date:
Hand dominance: Side operated on: Reaction time:
Grading key: GOOD FAIR POOR SLURRED

	Pre-operation	*Post-operation I*	*Post-operation II*
Co-ordination	Date:___	Date:___	Date:___
Eye-hand (timed):			
Pegboard (12 1¼" pegs)....	R_____ L_____	R_____ L_____	R_____ L_____
Hand-to-mouth:			
Cup-to-mouth	_____	_____	_____
Spoon-to-mouth	_____	_____	_____
Bi-lateral:			
Cymbals	_____	_____	_____
Cutting meat	_____	_____	_____
Dressing (Bi-lateral activities)			
Montessori Board (timed):			
Unbutton 2 large buttons.....	_____	_____	_____
Button 2 large buttons.....	_____	_____	_____
Unbutton 3 small buttons....	_____	_____	_____
Button 3 small buttons.....	_____	_____	_____
Activities of Daily Living			
Unbutton shirt	_____	_____	_____
Remove	_____	_____	_____
Place	_____	_____	_____
Button	_____	_____	_____
Tie shoe laces.....	_____	_____	_____
Reasoning			
9-piece puzzle (timed).....	_____	_____	_____
Orientation	_____	_____	_____
Memory	_____	_____	_____
Personal Hygiene			
Wash hands	_____	_____	_____
Brush teeth	_____	_____	_____
Shave	_____	_____	_____
Comb hair	_____	_____	_____
Communication			
Speech	_____	_____	_____

HANDWRITING SAMPLE

Pre-operation	*Post-operation I*	*Post-operation II*

CONNECT DOTS WITH LINES

Pre-operation		*Post-operation I*		*Post-operation II*	
•	•	•	•	•	•
•	•	•	•	•	•
•	•	•	•	•	•

COMMENTS:

CHART 2.—*Evaluation for Parkinson's Disease (Occupational Therapy)*

SUMMARY OF FINDINGS

KEY: Underline with—
Red for Pre-operation
Green for Post-operation I
Blue for Post-operation II

Name:
Unit #:

Tremor

With activity Present Absent Moderate Minimal Severe
Resting Present Absent Moderate Minimal Severe
Increased Decreased
Rigidity Slight Moderate Marked
*Bradykinesia** Slight Moderate Marked
Increased with activity Decreased with activity
Sialorrhea† ..Present Absent
Dressing Unassisted Partial assistance Great assistance Unable
Eating Unassisted Partial assistance Great assistance Unable

Problems due to—	*Pre-operation* Date:___	*Post-operation I* Date:___	*Post-operation II* Date:___
Rigidity	_____	_____	_____
Tremor	_____	_____	_____
Bradykinesia	_____	_____	_____
Mental changes	_____	_____	_____
Combination of one or more of the above.....	_____	_____	_____

Comments:

Occupational Therapist

*Slowness of movement. †Drool

CHART 3.—*Evaluation for Parkinson's Disease (Physical Therapy)*

Name: Age:
Unit Number: Date:
Side operated on: Main complaint: Dominant side:
Grading key: GOOD FAIR POOR

	Pre-operation Date:___	*Post-operation I* Date:___	*Post-operation II* Date:___
Sitting:			
Backless chair	_____	_____	_____
Back chair	_____	_____	_____
Rise to standing.....	_____	_____	_____
Stationary Standing:			
Without motivation activity	_____	_____	_____
With motivation activity..	_____	_____	_____
Ambulation:			
General gait	_____	_____	_____
Stairs and inclines.....	_____	_____	_____
Avoid objects and obstacles	_____	_____	_____
Activities on Exercise Mats:			
Face lying	_____	_____	_____
Roll side to side.....	_____	_____	_____
Lying to sitting.....	_____	_____	_____
Creep and crawl.....	_____	_____	_____
Co-ordination Activities:			
Throw and catch.....	_____	_____	_____
Cycling	_____	_____	_____
Punching bag	_____	_____	_____
Command Activities:			
Walk (stop, start, etc.)...	_____	_____	_____
Sit, stand, etc.....	_____	_____	_____
"Simple Simon"	_____	_____	_____

Comments:

of the activities of daily living combined with specific recordings of hand tremor.

On the basis of very similar tests, Schwab concluded that the patient best suited to surgical treatment is the one with unilateral signs only. He expressed belief that only one per cent of all patients with parkinsonism are ideal candidates for operation and only ten per cent are reasonably good candidates.

From the standpoint of the value derived from stereotactic procedures, Schwab found that 70 per cent of the patients he kept under observation showed obvious benefit for as long as they were observed, which for some of them was nine years. Some of these patients had complete absence of rigidity and tremor and it was anticipated that this improvement was permanent. The mortality risk involved in the operation was given as 2 per cent, and the risk of iatrogenic deterioration of condition, such as aggravation of muscle weakness and impairment of speech, was also reported as 2 per cent. Also, when the opposite side became involved at a later date, a second operation was indicated and this carried a slightly higher risk, especially with regard to involvement of speech.

From our own studies we would agree with Schwab that the best candidate for operation is the patient with unilateral signs. However, there are very few such patients; by far the majority of the patients we see have bilateral symptoms of tremor and rigidity in a moderately advanced stage. Certainly in evaluating the postoperative results in a patient who had only unilateral signs to begin with, an excellent result would be one in which all signs of tremor and rigidity were abolished. Yet in evaluating the postoperative result from the functional standpoint, the result would have to be considered "excellent" if a patient with severe bilateral involvement were brought back to the level of self sufficiency again, even though some tremor or rigidity persisted. Therefore, testing must be done in a way that measures not only functional result but, objectively, the changes brought about in each patient. It is not enough to try to state the condition of a patient merely by saying, for example, that tremor was 1 plus or 3 plus. Functions must be measured objectively, as we have been doing for the past two years, by utilizing newly available electronic techniques. This will make it possible to make objective comparison between the results reported at various treatment centers. Yet we must also keep in mind that scientific electronic measurements no matter how objective, do not measure the overall level of functional improvement, which is what the patient is most interested in.

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REFERENCES

1. Boshes, B., Wachs, H., Brumlik, J., Mier, M., and Petrovick, M.: Studies of tone, tremor and speech in normal persons and parkinsonian patients, Neurology, 10:805-812, Sept., 1960.

2. Brumlik, J., and Boshes, B.: Quantitation of muscle tone in normals and in parkinsonism, Arch. Neurol., 4:399-406, 1961.

3. Burns, B. D., and DeJone, J. D.: Preliminary report on measurement of Parkinson's disease, Neurology, 10:1096-1102, Dec., 1960.

4. England, A. C., Jr., and Schwab, R. S.: The management of Parkinson's disease, Arch. Int. Med., 104:439-468, 1959.

5. Lance, J. W., Schwab, R. S., and Peterson, E. A.: Action tremor and the cogwheel phenomenon in Parkinson's disease, Brain, 86:95-110, 1963.

6. Schwab, Robert S.: Symptomatology and medical treatment of Parkinson's disease, Internat. J. Neurol., 2:61-75, 1961.

7. Schwab, R. S., England, A. C., and Peterson, E.: Akinesia in Parkinson's disease, Neurology, 9:65-72, Jan., 1959.

8. Webster, D. D.: Dynamic measurement of rigidity, strength and tremor in Parkinson patients before and after destruction of mesial globus pallidus, Neurology, 10:157-163, Feb., 1960.



The Conservative Management of Neck Injuries

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■ *Previously a list of treatments which might be avoided in the care of simple neck sprains was published. The present discussion is with regard to treatment which may be used safely.*

The original discussion was to the effect that treatment should be avoided which aggravates the patient's pain.

Now suggestions are made for treatment which should not produce iatrogenic trauma.

This treatment has the advantage of reducing the financial cost to the injured person plus the medical advantage of shortening the period of treatment, reducing cost and disability.

IT IS NOTEWORTHY that in a symposium on "Disorders of the Cervical Spine" published in *Clinical Orthopaedics* there are 18 authors and 18 opinions.[3] It should also be observed that there are as many as 38 theories as to the cause of the bizarre symptoms, even including psychosis, that sometimes follow soft tissue injuries of the neck. It is noted, however, that no author mentions injury produced by treatment.

When soft tissue injuries of the neck are attributed to culpability of a third party—in reports such as "hit my rear bumper," or "ran a stoplight," or "slipped on a piece of lettuce on the supermarket floor"—the patient is plunged immediately into the emotional maelstrom of litigation in addition to whatever physical injury he may have received.

In a previous discussion of this subject, I expressed belief that the great majority of such neck injuries are simple sprains which might be treated as any other sprain is treated. It was noted in a review of the histories of these patients that the use of heat, especially of diathermy, may cause the pain related to sprain to continue more or less indefinitely. Sugar[7] recently published a statement that heat could enhance the relief obtained by the use of analgesic drugs, but he added the surprising observation that "diathermy appears to be the worst type of heat since it is apt to aggravate the pain." I can add from the histories of my own patients that this aggravation is possible even in the patient who sleeps on an electric pad, frequently without the knowledge of his physician.

I also noted in a previous discussion that in middle-aged persons in whom degenerative change of the midcervical region is already apparent, the constant use of diathermy in that area may have a crippling effect even in the absence of neck injury. Rowe[5,6] also recently observed this phenomenon.

Another observation was that among more than one thousand patients it was consistently noted that in unusually violent accidents involving major fractures or dislocations, injury to the neck was not reported by the patient and rarely mentioned by the physician, although neck injury surely must have occurred in some of those cases. This means that recovery from neck injury must have taken place without the patient's having any recollection of injury there.

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Since 1958 I have had opportunity to take extended histories and do examinations on 1,455 patients who have suffered injuries. Most of these patients had neck injuries although many were not aware that they had. Evidence of neck injury, however, was apparent to the examiner either in history or in physical findings.

These patients came from all parts of the western United States and from many of the eastern and middle western states. A common denominator in these cases was the faith of the patient and his physician in the use of diathermy, ultrasound therapy, heavy traction and rigid cervical collars. This faith is apparently widespread in the United States, for among the patients with neck injuries few had consulted an orthopedist until after a month or so of treatment by some other physician. In a few instances, orthopedists whose practice was in an emergency hospital or to whom injured persons were referred directly by attorneys, were consulted early.

Often the failure to obtain relief of symptoms by the physical therapy methods mentioned is attributed to undertreatment, with the result that the physician may recommend switching from three treatments weekly in the office to daily treatment in a hospital —perhaps twice daily when symptoms do not abate. As pain increases with what is called "intensive treatment" there are two courses that may be considered by the bewildered patient and physician. One is referral to someone for surgical operation; the other is the remote possibility that the patient may, against advice, quit taking the treatments.

Having had four major neck injuries myself which have so far caused me to lose one hour of work, but have required no treatment, I believe I can add something to our knowledge of injury of this type. We should all know that these sprains heal with a slight reduction in motion of which the patient is unaware. There is no pain after recovery seems complete.

Such limitation of motion may be iatrogenic. I have encountered two patients whose history was to the effect that they had had no neck pain at any time. Both had been placed in rigid cervical collars by their physicians because of the fact that the accident in which the injury was claimed involved a collision with a rear bumper. The two patients, one after seven months and the other after 18 months of rigid fixation, had no practical neck motion. Their histories, however, stated that they had had no neck pain at any time.

The hard collars in common use at the present time are admittedly time-saving and are frequently prescribed for 24-hour splinting of the neck. It has been noted consistently that patients wearing them found they were unable to lie down because to do so aggravated the neck pain. This is because recumbency adds traction to the sprained neck due to elevation of the shoulder girdle. Hence they removed the collar or slept sitting up.

I do not believe any of us would attach a traction apparatus to a sprained ankle in which we suspected ligamentous tears until these tears had had an opportunity to heal. After healing, any form of physiotherapy which will encourage active motion of the injured ankle is an acceptable treatment. It has been interesting to find how commonly fresh neck sprains are placed in motorized traction or traction with heavy weights. When patients were questioned about the effect of this treatment, almost invariably they said that the traction aggravated the pain but that they had been encouraged to continue with the traction with the idea that someday it would not be so painful. As a rule this ultimately proved to be true.

With our experience with rest as the primary treatment, followed by active motion, it has been found that the original rest treatment must be accomplished by some means which is sufficiently comfortable to permit continued rest to the sprain for 24 hours a day. Probably the simplest form of rest is bed rest with traction of about four pounds— a weight less than one-third the weight of the head. In a bed with the headrest slightly elevated, such a weight does not put any traction on the neck but it does provide a simple and comfortable way to protect it from sudden unguarded motion. This weight will not cause synovitis of the joints of the jaw. Most persons are able to learn to sleep in traction of this type, and many are able to carry on treatment at home.

The most effective ambulatory treatment has been use of the large, firm mattressed collar described by Schanz in 1908. This device has probably been made more usable by the cotton collar which was introduced by Lewin and is most recently illustrated in the text "Treatment of Injuries to Athletes" by O'Donoghue.[4] Now in the form of a long bandage of quilted flannel, the collar can be applied quite easily and it is sufficiently firm to support the weight of the head, yet soft enough to permit slight movement. Since it acts as a neck pillow when the patient lies down, it does not disturb sleep. It also has the advantage of retaining body heat which is an optimum form of heat therapy.

As the collar rests the muscles of the neck, the pain of simple sprains will ordinarily subside in three or four weeks.

Following removal of the collar or traction or transition from traction to collar and then to freedom of motion, treatment consists largely of encouraging the patient to keep working at active motion

of the neck, always cautioning that the motion be done within the painless range, a range that only the patient can determine.

Such a program of treatment usually will result in subjective recovery within a period of three months. If not, the injury may be of a more severe order, perhaps requiring surgical treatment.

It should be apparent at once that the simple program outlined has the distinct advantage that it puts the patient to practically no expense.

One of the most intelligent of pioneers in anterior cervical fusion in the west recently stated that "surgery should be delayed for at least a year because in many cases there is a remission after conservative treatment has failed."[2] I believe that he might also have said, as an alternative, "after conservative treatment has been stopped."

There is one additional little known observation which should be of importance. In examining families who have been involved in rear-end collisions, it is quite common that the adults have complaint of pain and the children are not considered injured. In two families I have observed three children whose parents had symptoms but who themselves had normal neck motion and no complaints. In all three children a reversal of the cervical lordosis was noted. As was stated in a previous communication,[1] the straight cervical spine can be a normal physiologic finding. However, reversed cervical lordosis requires some definite explanation. In these three children the reversal was present a year after an accident in which none of the three had ever been suspected of having been injured.

My point is not to disparage "unnecessary" treatment, for to many a patient the fact of having seen a doctor who listens patiently, understands and administers medication or some form of encouragement is worthwhile. My purpose is to warn against treatment which may do harm.

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REFERENCES

1. Crowe, Harold E.: A new diagnostic sign in neck injuries, Calif. Med., 100:12-13, Jan., 1964.

2. Harris, N. M., and Smith, A. J.: Rationale and technic for anterior fusion (Part of Symposium on Disorders of the Cervical Spine), in Clinical Orthopaedics, No. 24, J. B. Lippincott Co., Philadelphia, 1962, page 98.

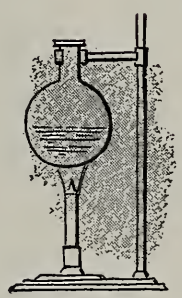
3. Jackson, Ruth: Preface—Symposium on Cervical Disorders, in Clinical Orthopaedics, No. 24, J. B. Lippincott Co., Philadelphia, 1962, pp. 9-11.

4. O'Donoghue, Don H.: Treatment of Injuries to Athletes, W. B. Saunders Company, Philadelphia, 1962, p. 338.

5. Rowe, Carter: Cervical osteoarthritis, N.E.J.M., 268: 1178-79; and 1351-52, May 23, 1963 and June 13, 1963.

6. Rowe, Carter: Personal Communication, 1964.

7. Sugar, Oscar: Bulletin of the Illinois Masonic Hospital, 1962.



Economic Aspects of "Whiplash" Injury

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■ *The term "whiplash," used to describe a neck injury received in an automobile accident, has no foundation in medical science to support the complaints of persons suing for damages. The term is gaining unwarranted popularity as a term describing an injury, even though there are no clinical or pathological findings to support it.*

"Whiplash" cases today account for an estimated 30 per cent of all injuries in automobile accidents. Direct compensation for damages paid to persons injured in automobile accidents in the United States in 1961 amounted to approximately one billion, seven hundred million dollars. It has been estimated that five hundred and eighty million dollars of that amount was paid in compensation on allegation of neck injuries.

WOVEN INTO THE PATTERN of the problem of "whiplash" injury, at least insofar as pecuniary claims are concerned, is the matter of the integrity of the subject who is urging his claim for injury against a motorist who is alleged to be responsible for the injury. Thus a moral issue is involved. Collateral to this issue and closely concerned in it is the necessity to determine the legitimacy of the injuries claimed and to consider the possible existence of genuine emotional overlays, the matter of psychosomatic factors and other problems. From this a physio-psychological issue may evolve.

Finally, determination must be made with regard to the ever-perplexing medical problem as to the genuine nature of the injury—assuming the case is indeed genuine—and what shall be a proper course of medical treatment to obtain optimum results.

If in my further discussion, which is from the standpoint of insurance claims, I seem to enter into areas of medical diagnosis and prognosis, I do so with apology and the explanation that these important considerations touch and concern the interests of the insurance industry.

First, a word about the term *whiplash*. It seems it came into being in its present connotation about 35 years ago when a young orthopedist[2] used the term to graphically describe certain physical facts of accidents which produced injury in the cervical area in eight patients who responded poorly to treatment. The term was never intended to do anything other than describe facts of an accident—most certainly not intended as the introduction of a new medical term to describe an injury.

It was intended only to say that the body had been subjected to a particular kind of external force, and *not* to say what the medical result was. There are adequate medical terms to describe the consequences, as there are adequate medical terms to describe the consequences of a "snapped neck," a "stretching," a "pulling," a "twisting," or the like. Thus, observing the consequences from the darkest viewpoint, the patient having been subjected to a so-called "whiplash" may receive a critical injury consisting of dislocation or fracture of the vertebral bodies, or he may have received only a mild myofascial strain of the cervical area. In any event, he does not afterward have a disease called "whiplash." Yet today we find courts, urged by certain lawyers and physicians, readily accepting "whiplash" as a medical term to describe an injury upon which to support a verdict when there otherwise exists no clinical or objective findings to support the subjective complaints of the plaintiff. This is the keystone of the entire problem facing the defendant in litigation of this type, whether he be insured or not.

Further consideration of the medical aspects of this problem by me as a layman is not indicated, for the inventor of this use of the term *whiplash* already has said what he did not mean by it.[4] I leave to the medical profession the task of making some acceptable disposition of the medical aspects of the problem, while I turn to the somewhat dull but nevertheless realistic consideration of the impact that claims for damages in "whiplash" cases have on motorists who are called upon to make payments in recompense.

At the outset, it must be made abundantly clear

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that so far as I know no responsible person identified with the insurance business or the defense side of the litigation of such claims has ever contended that an occupant of an automobile which is violently struck in the rear cannot receive a personal injury. We have all seen the serious consequences of such injuries—consequences that are readily describable in accepted medical terms. On the other hand, we have likewise seen many trivial injuries—described as cervical strains and sprains—received in the same kind of accident. But, I regret to say, we see all too many cases totally devoid of merit which are made the nucleus of protracted litigation at tremendous cost to the public. It is to this problem that I shall address the remainder of this communication.

"Whiplash" was not always a popular cause of action in the field of personal injury litigation. Thirty years ago litigation based on such a claim was totally unknown. Well do those of us who are identified with defense against claims for damages remember the popular injuries of those days. High on the popularity list was the injury then called the sacroiliac spread or slip. Well do we remember also the thousands of claims presented, particularly in behalf of young plaintiffs, on the grounds that Jacksonian epilepsy was present or in prospect because of an accident. Thousands of claims were settled with the possibility of Jacksonian epilepsy a large factor in the settlement. Yet within my personal experience I have never known of an actual case of Jacksonian epilepsy resulting from an automobile accident.

Now the "popular" injuries of yesterday's litigants have given way to the so-called "whiplash," which can be made the basis for the successful prosecution of claims for injuries of such nature that proof that they do not exist is very difficult if not impossible to establish.

Gotten[6] conducted a survey of 100 cases of "whiplash" involving injuries to the neck. The studies were made subsequent to settlement of claims or litigation involving these patients. Among the conclusions was that important psychosomatic symptoms developed and were manifest in one way or another in 85 per cent of all cases. Of the 100 patients, 88 made a total recovery, 54 of them with no residual symptoms whatever and 34 with occasional minor symptoms. But none of them sought additional medical attention. Of the remaining 12 patients, only six were asking medical treatment although the other six said they had considerable distress. Only two of the 100 patients required surgical treatment and in both instances the operation was considered successful.

In 1958, Frankel[4] made the following statement:

"The term 'whiplash injury' was fathered by the medical profession. Since then it has become the darling of an element of the legal profession. A persuasive lawyer with a modicum of histrionic ability can almost make a jury follow the course of his client's head and neck as it snaps backward two or three feet and is then propelled forward. Today, because of the confusion engendered by the faulty terminology, physicians would like to rename the monster they created."

In another work Frankel stated:[5]

"It might be more useful to return to our physical findings as a source of our descriptive terminology. Why not call a sprain a sprain, a concussion a concussion, and a fracture exactly what it is?"

On this subject Bosworth[1] made the following statement:

"There is no room, nor is there any reason for such a loose diagnosis as *whiplash injury of the neck*. This diagnosis is vague and thoroughly unscientific. Furthermore, its use may lead to extreme injustice to those responsible for causing these injuries due to the rather dramatic implication of this phrase . . .

"While pointing out the actual, and sometimes the severe, injuries that involve the cervical region of the spine, we should at the same time attempt to 'lay the ghost' of the *whiplash injury*. The term to the honest is merely a bulwark behind which ignorance skulks; to the dishonest, a mirage with which to confuse and delude."

Threadgill,[11] in a paper prepared in 1958, concluded, after having treated 88 patients involving injuries to the cervical area of the spine referred to him:

"Eighty-eight patients with alleged whiplash injury were examined after maximum treatment benefit had been obtained and the patients were awaiting financial settlement. Eleven patients were referred by agents of the plaintiff and the remainder by agents for the defendant. No permanent impairment was predicted in any of these cases except for possible emotional or conversion reactions. Symptoms were due in large part to abnormal fear present in the minds of the patients as a result of having heard the dread term 'whiplash injury' after the accident."

The Economic Impact

Unfortunately, there exists no totally reliable body of statistics to evaluate the monetary impact of jury awards and insurance settlements of "whiplash" cases. In 1963 Jury Verdict Research, Inc.[7] conducted a survey of 447 personal injury cases tried to a verdict in the state of Ohio in one year (1961-1962), 135 of which included cervical strain injuries either alone or in combination with other injuries. In 34 of the 135 cases, cervical injury was the sole injury alleged. It appears, therefore, that in approximately 30 per cent of all cases reported, cervical

injury is either the sole injury complained of or is involved along with other injuries.

Dr. Edward I. Compere of Northwestern University is reported to have said that 30 per cent of the accidents today involve neck injuries.

The study by Jury Verdict Research, Inc., contains conclusions reached with reference to the economic impact of litigating cases involving neck injuries upon the plaintiff, upon the plaintiff's attorney, and upon insurance companies on a case basis. From the conclusions reached, and assuming that the severity of the injuries to the neck, from the most trivial to the most grave, are reasonably comparable to injuries to other parts of the body, certain rough estimates can be made as to the total impact of the prosecution of this type of injury.

In the state of Ohio, total direct losses incurred for injuries received in automobile accidents amounted to $80,736,804[8] in the year 1961 (the latest figures available). Once again, assuming the range of severity of injury to the cervical area as being comparable to the range of injuries to other parts of the body, it would appear that the motorists of the state of Ohio contributed close to $27,000,000 for injuries of this type.

In the state of California in the year 1961, direct losses in the sum of $226,965,740 were paid for automobile accident personal injuries.[9] Assuming the ratio of cervical injury to injury of other parts of the body is the same in California as in Ohio, namely 30 per cent, and again assuming that the range of injury from the standpoint of severity is comparable to the injuries to other parts of the body, it would appear that the people of the state of California paid over $75,000,000 for injuries of this type. Finally, direct losses paid to persons injured in automobile accidents in the United States for 1961 amounted to $1,748,231,480.[10] Again making the same assumptions as have been made with reference to California, it would appear that the public paid to injured persons as a result of injuries to the cervical area arising out of automobile accidents, a sum of more than $580,000,000.

Is it any wonder that there is concern over the trend that has taken place with reference to monetary settlements on claims of "whiplash"? Of course it must be recognized that many people receive modest to extremely grave injuries to the cervical area and are entitled to be paid for those injuries when the circumstances are such that there is liability on someone's part for such injuries. However, the ratio of legitimate to false claims will probably never be known. It is to this aspect of the matter that I will direct my attention for a few moments.

Crowe,[3] reporting on a study of 300 "whiplash" cases, noted a small proportion with serious injury and expressed belief that in a considerable number of patients with simple sprain of the neck, symptoms that otherwise would subside spontaneously are actually aggravated by diathermy and other like forms of treatment.

Some measure of the cost of treatment of "whiplash" injuries, not to mention the cost of settling damage claims, can be obtained from the record of a physician's deposition in an action for damages in a Florida court in 1961 (*Green and Green vs. Tsiotsias,* 61L-2546, Circuit Court, 11th Judicial District, Dade County). In the deposition, the physician said that he had treated 3,000 "whiplash" cases in a little more than four years and had as many as "300 or 400 going currently." He said that between 90 and 95 per cent of the cases resulted from automobile accidents, that most of them came to litigation and that his average fee for treatment was $411.

There is, I think, abundant evidence that too much of the public's money is being paid, either directly or through insurance premiums, for too little injury and in too many cases for no injury whatever. This is a heavy burden for the privilege of operating a motor vehicle. While no one can quarrel with the fundamental premise that a negligent motorist should pay for the legitimate injuries which he causes as a result of the negligent operation of his vehicle, in my opinion too much of the remedial aspects of automobile accidents has deteriorated to the quality of a racket, and perhaps no one single situation has contributed more to this result than the uncertainties and dire implications in the use of the term *whiplash.*

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REFERENCES

1. Bosworth, D. M.: Whiplash—An unacceptable medical term, J. Bone & Joint Surg., 41:16, Jan., 1959.

2. Crowe, H. E.: Whiplash injuries of the cervical spine, pp. 176-184, in Section of Insurance, Negligence and Compensation Law Proceedings, 1958, American Bar Association, Chicago.

3. Crowe, H.: A new diagnostic sign in neck injuries, Calif. Med., 100:12-13, 1964.

4. Frankel, C. J.: Whiplash injuries of the neck, Defense Law J., 4:93, 1958.

5. Frankel, C. J., Holloway, J. W., McMaster, P. E., and Redden, K. R.: Lawyers Medical Cyclopedia, Volume 1—Personal Injuries and Allied Specialties, p. 446, Anatomy of the Neck, Allen Smith Co., Indianapolis, 1958.

6. Gotten, N.: Survey of 100 cases of whiplash injury after settlement of litigation, J.A.M.A., 162:865-867, 1956.

7. Jury Verdict Research, Inc., 2056 E. 4th St., Cleveland, Ohio, 1963.

8. The Spectator—Insurance by States of Fire and Marine, Casualty, Surety and Miscellaneous Lines, 1962 ed., Chilton Company, Philadelphia, State of Ohio 1961 Reports, p. 16.

9. Ibid., State of California 1961 Reports, p. 14.

10. Ibid., National Totals 1961, p. 58.

11. Threadgill, F. D.: Disability evaluation with preexisting impairment, Med. Ann. D.C., 27:573, 1958.

Local Temperature in Gastric Hypothermia

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■ *Measurements of temperatures inside the stomachs of humans by means of thermister probes introduced with the balloon used in cryotherapy indicated that the mucosa does not undergo freezing in this procedure.*

REPORTS by two groups of investigators on the local effects of gastric "freezing" appear to be in conflict. Wangensteen and coworkers[4] said that in humans the formation of ulcers in the stomach following the refrigerating procedure is uncommon. Lippman and associates[2] reported that when the same techniques were used in dogs, ulcer formation soon afterward is a common occurrence.

In the studies on which the foregoing reports were based, the temperature of the stomach was not known; it was merely assumed to be somewhere near the temperature of the cooling agent. To resolve the apparent conflict in observed results, more accurate measurement of the temperature of the stomach, preferably at various places on the mucosa, is needed. Hence a study was carried out to determine by direct means the local temperatures in the stomach when a coolant is circulated through a balloon that is expanded to fill the organ.

To this end, thermister probes placed in various positions were introduced simultaneously with the balloon in the hypothermia treatment of 44 patients who had duodenal ulcer. A Swenko gastric hypothermia machine was used to circulate the coolant, the temperature of which was –15° to –24°C as it was pumped into the stomach and –9° to –14°C as it emerged. The duration of treatment was from 45 to 60 minutes. The technique was that recommended by Peters and Wangensteen,[3] with the following modifications: Cetacaine spray instead of xylocaine gargle was used for local anesthesia of the throat. Meperidine, 50 mg, and atropine, 0.4 mg, were used as pre-medication. The balloon used was stomach-shaped.

To determine the positions of random-placed probes and the balloon in relation to the inner lining of the stomach, 60 cc of a contrast medium (Hypaque®) was introduced through a Levine tube into the stomach after the balloon was inflated as usual with an alcohol coolant. Three x-ray views taken of the abdomen showed the position of the balloon and of the probes (Figures 1, 2 and 3).

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Figure 1.—Intragastric balloon filled with ethanol. Coaxial tube appears near level of lower ribs on left side. Two temperature probes are noted, one near lesser curvature, the other near the greater curvature. Barium from recent upper gastrointestinal series is noted in colon.

The flow rate of the coolant was also measured. It was nearly the same in all cases. This factor becomes important when comparing observations with those of other investigators. Moreover, the flow rate was measured with the balloon outside and again with it inside the stomach. In both situations the rate was one liter of alcohol at −10°C in 40 seconds ± 2 seconds.

The tube through which the coolant was pumped into the balloon was tipped with a nozzle that had multiple side perforations and a blocked distal end. Concentrated ethanol served as the coolant. A standardized Yellow-Spring thermister electrothermometer recorded the temperatures of the probes.

The 44 patients were of four classifications, distinguished as follows:

Group I (12 cases). Probe taped to balloon to lie on greater curvature.

Group II (4 cases). Two probes attached to balloon; one near tip, one on greater curvature.

Group III (24 cases). Random placement of thermister probe.

Group IV (8 cases). Mucosal inspection by gastroscope before and after treatment. (Four of the patients in this group were also in one of the other three groups. Four were not.)

The temperatures recorded at the probes were as follows:

Group I. Average probe temperature was +7°C. Range was from +11°C to +4°C.

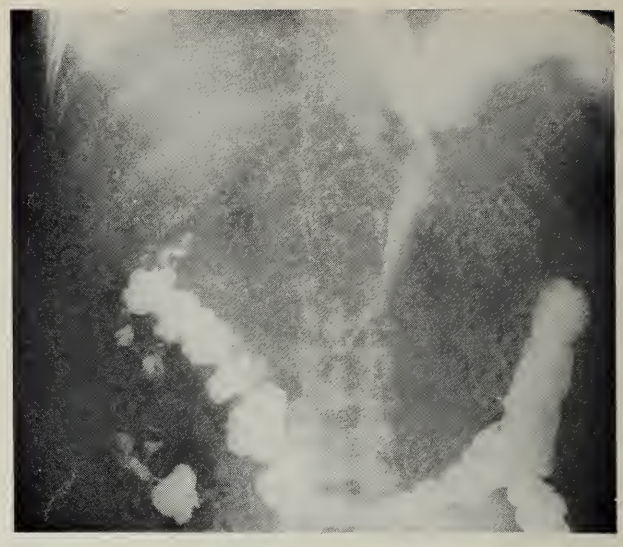


Figure 2.—Instillation of Hypaque® revealed what appeared to be air spaces near fundus and lesser curvature.

Group II. No recording was below +3°C. The greatest difference in any one case between one probe and another was 4°C.

Group III. Average probe temperature was +9°C. The lowest recorded temperature was +5°C.

Wangensteen recommended that on completion of the "freezing" treatment 5 minutes be allowed for ice crystals to melt and the balloon to separate from the wall of the stomach. Since the temperature recordings in the present study indicated freezing did not occur, we removed the balloon immediately after it was emptied of coolant. To find out what effect immediate withdrawal might have on the stomach mucosa, a Hirschowitz fiberoptic gastroscope was used in eight cases (Group IV) and no area of denudation or ulceration was seen in any of them. Hyperemia was noted in two cases and petechia in two.

X-ray films of the balloon-filled stomach with Hypaque as a contrast medium showed air in the cardia in some cases (Figure 3). The probes were visualized in a layer of Hypaque about 4 mm thick surrounding the balloon. In some instances the point of the probe was directed toward the mucosa, in some toward the balloon. As there was a liquid filled "buffer" zone between the balloon and the mucosa, it seems probable that the temperature of the mucosa was somewhat higher than the temperature recorded by the probes.

In some cases there was blood on the balloon when it was withdrawn, which at first was interpreted as due to continuing "freezing" for too long a time. On review of the cases in question, however, it appeared that blood on the balloon was more strongly related to a history of hemorrhage or gastritis than to long continued low temperatures.



Figure 3.—Lateral view, functioning pyloris is faintly visible. Distribution of Hypaque® over balloon was apparently not even.

Discussion

From the temperature recording of probes pressed against the gastric mucosa it appears that the term *gastric freeze* used in connection with the procedure described is a misnomer. More generally and more correctly it should be *gastric hypothermia* or *gastric cryotherapy*.

Five factors related to ulcer formation in dogs after their stomachs were "frozen" are listed by Lippman:[2] (1) Flow rate of coolant; (2) degree and duration of cold; (3) size of stomach and thickness of stomach wall; (4) intragastric position of tip of inflow apparatus and the force of the stream; and (5) nature and thickness of the material used for the gastric balloon. Other important factors that should be taken into consideration are the size of the animal or patient, the level of anesthesia during treatment, the type and amount of premedication, and the amount of coolant used related to distensibility of stomach.

The stomach is a very good heat exchanger, as is shown by the often recorded wide differences between the temperature of coolant as it is introduced and the temperature when withdrawn, the average difference being about 7°C. Calories are removed by this process, and the core temperature of the body (as measured rectally) is lowered. The size of the subject and the volume of blood in relation to the amount and temperature of coolant, therefore, become critical factors in determining gastric mucosal temperatures.

Intragastric cooling was first suggested in England to obtain general body hypothermia for hyperpyrexic children.[1] Shivering, which is a mechanism for warming, is eliminated by general anesthesia. Gastric hypothermia in dogs is always accomplished under a general anesthetic. An anesthetized animal, however, does not shiver. In humans a general anesthetic is never used in connection with gastric cryotherapy and most patients shiver before the treatment is completed.

Distensibility of the stomach is another vital factor. Conceivably the stomach will cool much more rapidly when stretched. Again a difference in dog experiments and human treatment is evident. The dogs are under anesthesia and the stomach is inflated by chance and by guess. In humans the stomach is inflated to a point of fullness but short of pain, the patient being awake and able to guide the therapist.

Conclusions drawn from gastric hypothermia experiments in dogs cannot be applied to human gastric cryotherapy because of the wide differences in subjects. There is another great barrier to comparisons: Dogs do not get peptic ulcers spontaneously.

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REFERENCES

1. Koabil, H. H., and Mackieth, R. C.: A simple method of raising and lowering body temperatures, Brit. M. J., 2:734, 1954.

2. Lippman, H. N., Morgenstern, L., and Parish, J.: The nature of gastric ulcers seen after local gastric hypothermia in dogs, Calif. Med., 99:173-5, September 1963.

3. Peters, E. T., Bernstein, E. F., Sosin, H., Madsen, A. J., Walden, A. I., and Wangensteen, O. H.: Technique of gastric freezing in the treatment of duodenal ulcers, J.A.M.A., 181:760-64.

4. Wangensteen, O. H., Peter, E. T., Nicoloff, D. M., Walden, A. I., Sosin, H., and Bernstein, E. F.: Achieving physiological gastrectomy by gastric freezing, J.A.M.A., 180:439-44, May 1962.

Science, Mysticism and Psychopharmacology

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■ *Historically, psychopharmaceutical agents have been used to produce a mystical state with the religious connotation of "a union with Divine Nature" or of "oneness with God." Such transcendental states are also known to occur in starvation, self-flagellation, Yoga and various psychoses.*

A common psychological origin is suggested for these states, in which there is a psychic regression to an early phase of development. This genetically is the phase wherein the infant is still united with the mother and has not yet established the boundaries between the "self" and the "not-self." In a subtler form, the desire to regress to this phase may be a universal yearning which affects the physician, the investigator and even the manufacturer of drugs. Accordingly, we have a profusion of tranquilizers, euphoriants and ataractics the prescription or the investigation of which may give vicarious pleasure and relief of tension to the physician and scientist by a process of identification with the person receiving the drug.

Mankind's quest for psychic development is difficult and precarious, alternately marked by progression and regression. Excesses in the use of drugs are indicated as regressive in nature.

In the ten years since its graduation from a neologism, the word psychopharmacology has developed a staid respectability and the new discipline it heralded may well be opening a new era of psychiatry.

Historically, the use of drugs is as old as the records of man himself, and if we go back into antiquity we find that drugs have been used notably for the production of a mystical state, with the religious connotation of a union with the Divine Nature. We read of the worship of liquor in the Dionysian rites[5]; and peyote[19,21] and hashish have been well known in mystic rituals. It is said that the whole Rig Veda is a collection of hymns for soma worship.[14] There are other equally effective ways of inducing a transcendental state, including starvation, self-flagellation, isolation, active torture and psychosis, none of which is recommended by psychiatrists as therapeutic.

The drugs mentioned, and many others as well, have been used to produce a great variety of psychic phenomena, including religious ecstasy, hallucinations and sometimes, unconsciousness. Bromides, manganese, insulin and pentylenetetrazol are only a few of the many drugs which have had their psychopharmacological era.

A fairly generally accepted definition of science is that it is the collection and collation of facts, bearing in mind that facts sometimes are difficult to determine objectively. Mysticism, however, is so intensely subjective that a general definition could probably not be arrived at; however, it connotes a "union of the self with a larger-than-self, be it called the World Spirit, God, the Absolute, or otherwise."[14] Further, it may be called "a merging of the individual will with the Universal Will, a consciousness of immediate relation with the Divine, or an intuitive certainty of contact with the supersensual world."[14] Such "transcendental" states have been called the "sense of oneness with the world," "the sense of Universal identity," "the final stage of Samadhi of the Yogi,"[1] or sometimes "the unity with God" of the earlier Christian mystics. There are common features here with the effects of drugs which suggest a common psychological origin, and it will be our task to try to determine what the common origin may be. Currently, we do not see such famous mystics as St. Paul, St. Francis of Assissi, St. John of the Cross, Madame Guyon, and Eckhart[14,18]; but recurrences of mysticism still appear, as in certain sects of recent origin, and some of the periodical evangelical revivals. It is generally true that the more advanced the religion, the less regard its votaries have for mystical states; and it is in the more primitive peoples, and the more primitive areas of our civilized countries, that mysticism and the religious ecstasies that go with it still flourish.[5]

While this Grand Mysticism is no longer so frequent, there is another type, which I prefer to call neo-mysticism, current in our times. Since it is couched in scientific terms and often associated with the use of newer drugs such as the hallucinogens and tranquilizers, it is much more subtle than its predecessor. When, after a single dose of a drug, one hears such phrases as "The integrative function of the ego was enhanced"; when patients say they have had "a great awakening" or they are "more tolerant, more peaceful, and know better the difference between right and wrong": when, in addition, they report they "have seen the white light that means the nearness to God," or they feel "I am the world and there is no absolute me or absolute others," then one suspects that neo-mysticism is at work either in patient or therapist. In the last half century of psychiatric investigation, there have been many drugs and various procedures[11,23] for which high proportions of cures were claimed. Usually these claims gradually dwindle, and it is the beginning of the end of their reign of popularity when the literature begins to report of them that "the greatest use of the drug is to facilitate psychotherapy." Mystical beliefs and not scientific adherence, may be the determining factors in the investigators.

Eons of Bliss . . . In a Single Hour

Aldous Huxley, gifted writer that he is, is perhaps the unwitting spokesman of this neo-mysticism. His observational data on the effects of mescaline are both valid and fascinating. Since he touches on the domain of science, however, we have the privilege of turning as fine a scientific microscope as we have on his writings, and on his interpretations.

He says,[8] "The experience of self-transcendence and the release of tension produced by alcohol and the other consciousness-changing drugs is so wonderful, so blessed and blissful, that men have found it quite natural to identify these drugs, to which they owe their momentary happiness, with one or other of their Gods." Further, he says: ". . . the pharmacologists will give us something that most human beings have never had before; if we want joy, peace and loving-kindness, it will give us loving-kindness, peace and joy. If we want beauty, it will transfigure the outside world for us and open the door to visions of unimaginable richness and significance. If our desire is for life everlasting, they will give us the next best thing, eons of blissful experience, miraculously telescoped into a single hour . . . Human

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beings will be able to achieve effortlessly what in the past could only be achieved with difficulties by means of self-control and spiritual exercises."

Even the most intrepid psychopharmacologist must quail at such a task. The foregoing excerpt from a paper appears to describe a universal longing, enchantingly expressed by a creative and imaginative writer. And yet, the paper was presented before the New York Academy of Science.[8]

Peace of Mind for Sale

There seems to be no area where the peace-of-mind purveyors fear to tread. I quote from advertisements of some manufacturers of tranquilizers: "Does your child sleep poorly at night? Does your child have anxiety? Is he homesick because of vacation, or entering school?" (The answer to your problems is in a little pill.) "Are you afraid of impending or realized parenthood? Do you have financial worries? Are you unable to relax? Do you have family tensions produced by accidents, weddings, funerals, temporary or permanent family separations, and differing opinions?" (Do not let it worry you—the answer is in a little bottle.) "Are you anxious over interviews or competitive examinations? Do you worry about public appearances? Are you an actor or actress, radio or television announcer, or performer? Are you an executive at business meetings, a toastmaster, a master of ceremonies? Are you a minister, teacher, professor, or politician? Are you in the newspaper field, or in advertising? Or are you an excitable athlete?" All the answers are supplied—with special doses for children under three. But from three to one hundred and three, your life's anxieties are apparently over.

The popularity of one drug reached such an unusual pitch that when it became scarce the eagerness and avidity for it was equalled only by the intense drive for meat ration points in World War II. Disproportionate claims and methods of exploitation of a few manufacturers of tranquilizers have been considered in an editorial by Kline.[12] However, the demands for tranquilizers and other drugs have not been due to any one group, and it appears likely that often pharmaceutical houses, doctors, and patients alike have all been influenced by the same basic need for "tranquilization."

Investigative Work

There is considerable valuable investigative work going on with the hallucinogens, tranquilizers and newly discovered body chemicals which should not only be continued but expanded. A review of over 200 papers on LSD-25 and mescaline[15] and related compounds gives an interesting account of the fact, fiction and fantasy involved in experimental studies of these drugs. Whatever the mode of action, there is probably one factor that is common to most. This is the regressive feature of these drugs. With few exceptions — and here we include hashish, peyote, stramonium, and other drugs used to induce the mystical state, as well as LSD-25, chlorpromazine and the other tranquilizers—there is some inhibition of cortical or subcortical functions. This regression varies in depth from drug to drug and varies with the psychological state and the personality structure of the individual. In some drugs there are stimulatory factors as well as inhibitory, but generally, in the regressive states induced, there is paralysis of the higher functions with the appearance of archaic or infantile attitudes and reactions.

It is helpful here to recall the writings of Hughlings Jackson,[22] as brilliant and valid today as when he wrote many years ago, of the hierarchy of physiological levels with the appearance of more primitive responses as the higher centers become impaired. Regression, however, is not restricted to the use of certain drugs. The psychiatric literature is replete with evidence of regression, complete or partial, in response to psychic and physical traumata—brainwashing, the privations of war and imprisonment and, as recent work has shown, sensory isolation. All of these may produce the phenomena of regression and more primitive modes of response. And where regression is the greatest there is the most intense infantile drive for dependency and for reunion with the powerful, protecting parent.

Through the descriptions of the peyote ritual, the historical records of the mystery Eleusinian rites,[16] and the descriptions of the ultimate union with Brahman of Yoga, runs the theme of unity, of the part that joins the whole, of the yearning to be lost in something greater, stronger, more powerful, more expansive. It is likely that in every era, every land, every religion, this yearning is present, and there are innumerable evidences of it present in our current culture as well.

The Subjective and the Objective Effects of Mescaline

So now let us return to Huxley's admirable description of a mescaline experience.[9,10] He reports that visual impressions are greatly intensified, that interest in space is diminished, and interest in time falls almost to zero. He describes a feeling of detachment from the things of the world. He speaks of the conviction of the subject that experiences under mescaline are "better." There is a heightened sense of beauty, described with words like "grace" and "transfiguration." He further describes the separation of the word concept from the thing-in-itself, which he says has now the quality of "suchness" and

which I will call concrete as opposed to the abstract. The subject, he says, has lost his "Self-ness" and now becomes the "Not-self," and now has the experience of "Mind at Large."

Let me add a few other observations. Mescaline will often produce euphoria or depression or alternation of these. There is often an exaggeration of the usual personality trends, and anxiety frequently occurs. Inhibitions are diminished and early memories may appear. Depersonalization phenomena are frequent. The essence of this state, Huxley says, is "the sense of One-ness, the reconciliation of opposites, the transcending of the subject-object relationship, the sense of universal life, the sense of intense gratitude for being alive, the sense of the beauty and mystery of the world, the sense of the absoluteness of phenomena, the infinity of the finite, the eternity of transient moments."

If we now examine this description, substituting for the more mystical, the more objective scientific attitude, it seems apparent that Huxley has given a rather good description of the unconscious, as it has been delineated in our psychiatric textbooks. Our vocabulary is somewhat different. We speak of the primary process, the fusion of self and not-self, the replacement of concrete for abstract concepts, the timelessness, the absence of verbal symbols. We would say that here is described the earliest infantile states, where the newborn child begins to experience both internal and external stimuli, from the comforting security of its mother's arms. It does not yet differentiate the I from the You and is still part of the limitless expanse of its own world, which of course encompasses the mother. We know that each experience, each stimulus, each trauma, each sound and sight impels a differentiation on the child from its mother, and thereby establishes its separateness. Indeed, these are the very factors which create the ego from its matrix. "I was seeing what Adam had seen on the morning of his creation—the miracle, moment by moment, of naked existence," reports Huxley of his mescaline experience. Could anyone better express regression to the neonatal period from which stem the fantasies of rebirth, reincarnation and perhaps redemption?

Many gifted people with channels of communication to the unconscious adequately open, can express these feelings more or less directly in great works of art, literature and religion. Others can experience these feelings only indirectly, perhaps through identification and empathy. But a communication with the unconscious is emphasized here, not a surrender to it. Surrender leads to a disintegration of the ego, in whole or in part, and we are beginning to accumulate data on such occurrences following the use of LSD-25.[3]

Aspects of Regression

We recognize that there are various phases in the states of regression induced by LSD-25 and these may be established anywhere along the line of the hierarchical psychodynamic development of the individual. Furthermore, there may be regressive symptoms or signs from every level of the hierarchy simultaneously. From the clinical point of view we may have states of depression, ecstasy and depersonalization and the picture of hysterical, obsessive-compulsive or psychotic disorders. We are here concerned with the ultimate stage of regression, the earliest infantile state and the "oceanic" feeling described in psychopathological works. It has not been mentioned so far, but it is important to note that the fear of such regression may also be very terrifying, and intense anxiety states frequently develop. Not only is there the desire to be incorporated in the whole, but also there is the terror of being swallowed up, and of the ego being annihilated.[6] Again, as Huxley describes it, "there is a Hell, as well as a Heaven," and I might add, there is the goddess Kali of Destruction as well as the goddess Demeter of Beneficence and Creation.

Those who have taken LSD (as the author has) or mescaline, can often perceive the regressive features of the reaction because a part of the ego remains intact and judgmental. If we have correctly identified the drug experience, at least in part, as a regressive yearning for a conflict-free early relationship, we must still raise the question: Is this a maturing and productive procedure? The state, we have said, is a regressive one and a primitive one; and yet sleep, too, is a voluntarily induced regressive state. Biologically it has an anabolic and restorative function. Similarly, periods of regression might be artificially induced in "the service of the ego," as Ernst Kris has said[13] and there are other regressive states useful in the psychic economy.[7] The sleep treatment of a quarter century ago was an unsuccessful attempt in this direction. This use for the newer drugs has not been established. It is important, however, as scientists that we have a clear idea of what the state is which we are producing and for what conditions we are prescribing it.

A further question remains: If the feeling of gratification in having achieved a transcendental state is a part of the patient's psychic reality, should we confront him with what we may believe is a more objective reality? This cannot be answered categorically, of course, since such a confrontation might accelerate the progress of a psychiatric disorder, but we regard as axiomatic that it is good for the therapist to know reality, even if it is true that objective reality itself is never completely objective. We believe that if the therapist himself has a subjectively

distorted concept of reality, by so much will he be limited in helping others.

In view of the foregoing, we see the so-called transcendental states not as a progressive, forward looking, or beyond-going experience, but the backward look. It is rather seen as a desire to experience a state of union, not with the Divine Nature or a mystical equivalent, but with the mother of the long-forgotten childhood. Huxley's phrase "downward self-transcendence" suggests a recognition, I believe, that he deals with a regressive process. Since any discussion of mysticism touches on religion and on theology, it should be noted here, that psychiatry does not and cannot speak of what the Divine Nature or God *actually* is. This is beyond the purview of psychiatry. It can only try to understand man's varying *conception* of God.

I would like to mention briefly a recent experiment. A series of subjects were given LSD-25[4] seven weeks before a series of interviews. There was an intense reaction, even turbulence, during this time. The broader study was reported previously[4] and I will mention only three subjects in whom the associations to the vivid and dramatic LSD experiences were most obviously connected with regressive mother-child relationships.

Subject No. 1, a woman, under LSD said, "I was hilarious. If I laughed more I would go into complete insanity. I was my own mother, watching myself giving birth to thousands of babies. I was floating in space, great expanses, miles and miles, semi-dark, looking down at myself." During the nine months before LSD, she had been in a depression and had wanted help through recovering childhood memories. She said that the main reason for her wanting therapy following LSD was a desire to understand this fantasy which appeared at that time.

Subject No. 2, a man, under LSD felt "dissolved right through a series of brick and stone walls. I felt as though I were a child. I felt very strange. I was living from the inside out." In the later sessions, he talked of losing his mother at the age of three, and broke into tears. "I have a feeling of tremendous loss. It's getting damn near the point of brutality." He said that he badly needed treatment, not just in the group situation, but privately as well.

Subject No. 3, a man, under LSD was "laughing hysterically; everything seemed hilariously funny." This alternated with periods of depression. During the last sessions he referred to an intense, almost hallucinatory experience of being terribly angry with his mother, an aunt, two wives and his son—all but the son being mother surrogates to him. This was followed by uncontrollable weeping and the words: "I got the bull by the tail. Is this reality or dangerous? Is it going into a smash? I don't seem to mind. Jane [another subject] says she has spiritual perfection now. Can I hit the levels Huxley describes in his books?"

These illustrations show an unpleasant feeling tone with the regressive content, but the subjects fluctuate between an ecstatic and painful affect. In most, the elevated mood persisted following the experience.

The Seduction of the Scientists

The ideal figure of a scientist is that of the single-purposed individual who indomitably sacrifices all to the one prized goal of truth and reality. Studies of countertransference and communication have shown us, however, how subjective and emotionally influenced the psychiatrist may be.[17] The power of wellbeing, comfort, security and passivity, as Braceland[2] wrote, affects the scientist also. He too has a longing to discover and savor the modern equivalent of the elixir of tranquility. He perhaps has too much awareness to enjoy it directly, but he can vicariously experience it through identification with his patient. There may be an uncritical eagerness to share in the soul-soothing day-dreams of the writer and poet, in the reflections and meditations of the philosopher, and in the comforting assurance of salvation offered by some religions. There may be an equally intense eagerness for many creative, religious and dedicated people to obtain scientific sanction for their own particular fantasies. There may be a danger, therefore, that the scientific attitude will be alloyed with subjectivity and fantasy, while the creativity of the poet, the artist and the writer will be constricted by the obeisance to pseudo-scientific theory.

Let me quote from Leuba again: "The Yogin as also the user of drugs may win partial or total unconsciousness, and with it isolation and peace but . . . this peace and isolation does not have the exotic significance attributed to . . . them . . . The corresponding self-deception of the user of drugs, and . . . the practices of the Christian mystics, constitute one of the most tragic chapters of human history. To aim so high and to fall so low is in truth a deep tragedy and high comedy."

I would add that the psychopharmacological agents thus far, contrary to some claims, have neither extended nor sharpened consciousness, the principal adaptational tool of man, but during the experience have made it vague, amorphous and primitive. A scientific study of these states of consciousness is important, and should certainly be continued, but the investigator, at least, should maintain his consciousness as sharp and acute as possible. I refer here to the technique used by some advocates of LSD to take the drug simultaneously with the patient,[20] presumably to "increase empathy." It may be that thus, in the guise of scientific

investigation, the investigator can without guilt partake of the delights that Huxley wrote of.

The ascent of mankind to higher stages of psychic development has been a difficult and precarious one, marked now by progression, now by regression; and the profusion of tranquilizers, euphoriants, and ataractics is a ubiquitous evidence of the instability of our achievements. Science is the path we have chosen to aid in man's growth and development, and mysticism in whatever guise is a contaminant of the scientific attitude.

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REFERENCES

1. Bohanan, K. T.: Yoga, A Scientific Evaluation, The Macmillan Co., New York, 1938.

2. Braceland, F. J.: Psychiatry and the science of man, Am. J. Psychiat., 114:1, July, 1957.

3. Cohen, S., and Ditman, K. S.: Prolonged adverse reactions to lysergic acid diethylamide, Arch. Gen. Psychiat., 8:475-480, May, 1963.

4. Ditman, K. S., Hayman, M., and Whittlesey, J. R. B.: Nature and frequency of claims following LSD, J. Nerv. & Mental Dis., 134:346-352, April, 1962.

5. Frazer, J. T.: The Golden Bough, The Macmillan Co., New York, 1934.

6. Hayman, M.: Traumatic elements in the analysis of a borderline case, Int. J. Psa., 38:1, 1957.

7. Hartmann, H.: Psychoanalysis and the concept of health, Int. J. Psa., 20:308, 1939.

8. Huxley, A.: The History of Tension, Annals New York Academy of Sciences, Vol. 67, Art. 10, p. 675, May, 1957.

9. Huxley, A.: The Doors of Perception, Harper & Bros., New York, 1954.

10. Huxley, A.: Heaven and Hell, Chatto & Winders, London, 1956.

11. Kalinowsky, L. B., and Hoch, P. H.: Shock Treatments, Psychosurgery and Other Somatic Treatments in Psychiatry, 2nd Ed., Grune & Stratton, New York, 1952.

12. Kline, N. S.: Relation of psychiatry to the pharmaceutical industry, Arch. Neurol. & Psychiat., 77:611, June, 1957.

13. Kris, E.: Opening Remarks on Psychoanalytic Child Psychology. Psychoanalytic Study of the Child, Int. Univ. Press, Vol. VI, 1951.

14. Leuba, J. H.: The Psychology of Religious Mysticism, Harcourt, Brace & Co., New York, 1925.

15. LSD-25 Annotated Bibliography, Sandoz Pharmaceuticals, 1957.

16. Neumann, E.: The Great Mother, The Bollinger Foundation, New York, 1955.

17. Panel, An Integrated Approach to the Objective Study of the Therapeutic Process, Western Divisional Meeting of the American Psychiatric Association, Nov., 1957.

18. Pratt, J. B.: The Religious Consciousness, The Macmillan Co., New York, 1938.

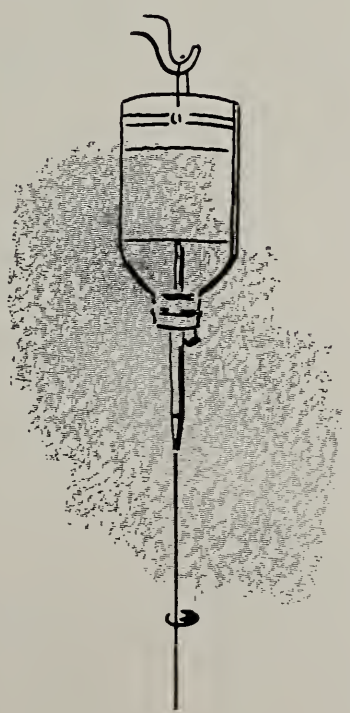
19. Rodin, P.: Crashing Thunder, D. Appleton & Co., New York, 1926.

20. Selected Papers, North American Association of Alcoholism Programs, p. 57, Oct., 1962.

21. Slotkin, J. S.: The Peyote Religion, The Free Press, Glencoe, Ill., 1956.

22. Wilson, S. A. K.: Neurology, Ed. A. N. Bruce, 2nd Ed., Butterworth, London, 1954-1955.

23. Wright, W. W.: Results obtained by the intensive use of bromides, Am. J. Psychiat., 82:365, Jan., 1926.



Traffic Deaths

A Preliminary Study of Urban and Rural Fatalities in California

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■ *An analysis by the California Department of Public Health of California Highway Patrol reports for 1961 showed that traffic accidents injured one and one-half times as many people per 1,000 population in rural California counties (under 50,000 people) as in urban counties (over 500,000 people), also persons injured in rural counties were almost four times as likely to die of their injuries as those injured in urban counties.*

A death certificate study was undertaken of 782 traffic deaths (excluding pedestrians) occurring in rural and urban California counties during 1961. Accidents occurring in rural counties tended to be single vehicle accidents which resulted in less severe injuries, while those in urban counties tended to be two vehicle and multiple vehicle accidents resulting in more serious injuries. The anatomic distribution of injuries was the same for both urban and rural accidents. However, people dying in rural accidents more frequently died at the scene of the accident, died sooner after injury, and died of less serious injuries than did those injured in urban accidents. For injuries where theoretically few lives should be salvaged by prompt emergency care, the time between injury and death was about the same in urban as in rural counties. Where such care should delay or prevent death because the injury was possibly or probably salvageable, those injured in rural counties died more quickly.

Thirty-two per cent of fatalities in rural counties happened to urban and out-of-state residents, while only 12 per cent of fatalities in urban counties were to rural or out-of-state residents, suggesting that traffic accidents to nonresidents may place an excessive load upon medical care resources in rural areas.

An analysis by the California Department of Public Health of California Highway Patrol data for 1961 showed that there were many more traffic injuries and fatalities per thousand population occurring in the 24 rural counties (those with population less than 50,000) than in the 34 more populous counties of the State, and that of people injured in rural counties, almost four times as many died as of those injured in counties with over 500,000 residents (Table 1).

Because most of the very rural counties also are quite mountainous, and are used as recreational areas, several questions were raised.

1. Are the road conditions or driving conditions in rural counties such that injury and fatality producing accidents are more likely to occur than in urban counties?

2. Are the excessive injury and fatality rates per thousand residents in rural counties explained by an influx of urban and out-of-state drivers who are involved in accidents while using rural areas for recreational and other purposes?

3. Is the higher case fatality ratio in rural counties explained by factors occurring after the accident has happened, such as delay in discovering the accident, difficulty in getting emergency medical care to the scene of the accident, greater distances from hospital facilities, and perhaps less specialized rescue and medical facilities of all types than might be found in urban areas?

A preliminary death certificate study was undertaken of 782 traffic fatalities occurring during 1961 in highly rural counties (fewer than 50,000 residents) and highly urban counties (over 500,000 residents) in order to answer these questions.

Method

For the year 1961 all death certificates for traffic fatalities (excluding pedestrian, motorcycle, and bicycle deaths) occurring in rural California counties (under 50,000 people), and 50 per cent of the certificates for similar traffic fatalities in urban counties (over 500,000 people) were studied. Of 820 certificates, 38 were excluded because the victim, although involved in a vehicular accident, did not meet criteria of being enclosed or "packaged" in the vehicle at the time of the accident. The final sample of 782 certificates included 251 fatalities occurring in rural counties, and 531 occurring in urban counties.

The certificates were analyzed by age, sex, and county of residence of the person; county of injury and death; distance between place of injury and place of death; time interval between injury and death; date, day of week, and hour of injury; and type of accident (single vehicle, multiple vehicle, etc.). In addition an analysis was made of the anatomic areas injured and of the nature of the injuries (fracture, contusion, etc.). Also an estimate was made of the *presumed salvageability** of the injury listed as the primary cause of death.

Results

Question 1: Are road conditions or driving conditions in rural counties such that injury and fatality-producing accidents are more likely to occur than in urban counties?

Criteria for measuring the severity of an accident may include speed at time of impact, type of collision and extent of injury to the vehicle and to the occupants. Because police reports of the accidents were not available at this time, it was not possible to determine speed or damage to the vehicle. However, it was found that single vehicle non-collision accidents (such as skids and rollovers) more frequently occurred in rural counties, while two car and multiple car collisions were more frequent in urban counties (Table 2). Since two car and multiple car collisions more often involve the additive forces of two or more missiles, it is reasonable to assume that urban accidents in this study tended to be more severe. This was supported by the finding of a direct progression of nonsalvageable injuries with accident type, single vehicle non-collision accidents having the smallest proportion of nonsalvageable injuries, and multiple vehicle and vehicle versus train collisions having the highest proportion (Chart 1). Thus, it would appear that rural counties, rather than having more serious types of accidents, seem to have somewhat less serious ones.

Question 2: Are the excessive injury and fatality rates per thousand residents in rural counties ex-

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*Presumed salvageability is an estimate of the individual's probable chances for survival if immediate and adequate emergency medical care and first aid had been available. Two criteria were used in assessing salvageability. First, on the basis of clinical judgment, injuries in a sample of 1960 certificates were grouped into categories of *probably not salvageable, possibly salvageable, probably salvageable,* and *salvageability unknown.* For instance, death from external hemorrhage was considered as probably salvageable while that from brain laceration was considered probably not salvageable.

Next, several series of cases of automotive trauma requiring hospitalization were reviewed in the medical literature after a previous decision that a death rate of approximately 25 per cent in a group of patients with a given type of injury would classify that injury as *probably salvageable,* while a death rate of 50 per cent would be considered as indicating the injury was of the *possibly salvageable* category and one of 75 per cent would classify the injury as *not salvageable.* In every instance except one there was agreement between the clinical estimate and the more objective criterion of actual per cent of deaths occurring from a specific type and location of injury. Where a vague cause of death, such as "multiple trauma," was listed, the injury was classified as *salvageability unknown.* Because autopsy records, although in existence, were not readily available it was not possible to obtain more specific information about these deaths at the present time. This will be done before further studies are undertaken. The salvageability scale based on these criteria was then applied to the death certificates for 1961.

plained by an influx of urban and out-of-state drivers who are involved in accidents while using rural areas for recreational and other purposes?

Twenty-one per cent of fatalities occurring in rural counties were to residents of urban counties, and 11 per cent were to out-of-state residents. Of fatalities occurring in urban counties only 6 per cent were to rural residents, and 6 per cent to out-of-state residents. Thus, almost three times as many of the fatalities in rural counties were to nonresidents as in the urban counties. However, the large number of nonresidents dying in rural counties does not completely explain the excessive fatality rate in these counties. If traffic death rates in rural counties to rural residents are compared with death rates in urban counties to urban residents, it is found that rural residents still had at least twice the risk of dying in an automobile accident as did urban residents. The fact that so large a proportion of the deaths occurring in rural areas involved nonresidents does not alter the fact that the rural resident himself was at greater risk of dying in an automobile accident than if he were an urban resident.

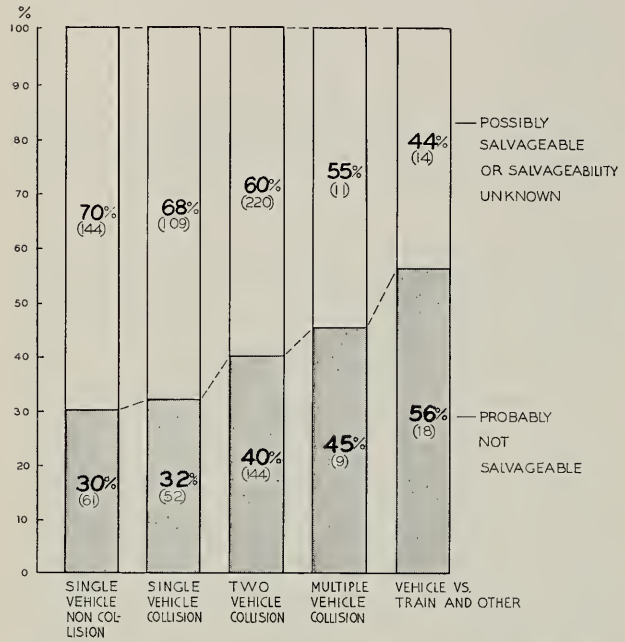


Chart 1.—Proportion of fatalities with injuries probably not salvageable by type of traffic accident, California, 1961.

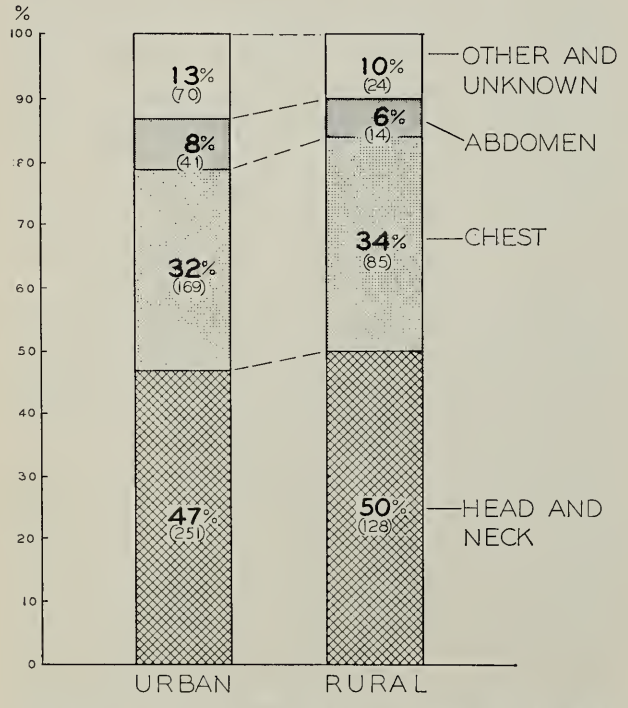


Chart 2.—Anatomic distribution of traffic injuries causing fatality in urban and rural California counties, 1961.

TABLE 1.—*California Traffic Injuries and Fatalities by Urban and Rural County of Occurrence, 1961*

	Urban Counties	*Rural Counties*
Injuries/1,000 population	9.17	13.72
Fatalities/1,000 population	0.153	0.636
Case fatality ratio	0.013	0.047

Source: State of California, Department of Public Health, *California Health Trends*. State of California, Department of Highway Patrol —*Annual Statistical Report, 1961*.

TABLE 2.—*Type of Traffic Accident Leading to Fatality by Urban and Rural County of Occurrence—California, 1961*

Type of Accident	*County of Occurrence*	
	Urban	*Rural*
Single vehicle, noncollision	21%	38%
Single vehicle, collision	21	21
Two vehicles, collision	51	36
Multiple vehicle, collision	3	1
Vehicle vs. train, and other	4	4
Total per cent	100	100
Total numbers	531	251

TABLE 3.—*Place of Residence for Persons Fatally Injured in California by Urban and Rural County, and Hour in Which Injury Occurred*

	Hour Injury Occurred			
	Midnight-6 a.m. Per Cent	*6 a.m.-Noon- Per Cent*	*Noon-6 p.m. Per Cent*	*6 p.m.-Midnight Per Cent*
Urban accidents				
Urban residents	86	86	88	89
Rural residents	5	9	4	7
Out-of-state residents	9	5	8	4
Total per cent	100	100	100	100
Total numbers	144	98	129	160
Rural accidents				
Urban residents	32	16	17	19
Rural residents	58	67	70	75
Out-of-state residents	10	18	13	6
Total per cent	100	100	100	100
Total numbers	62	45	75	69

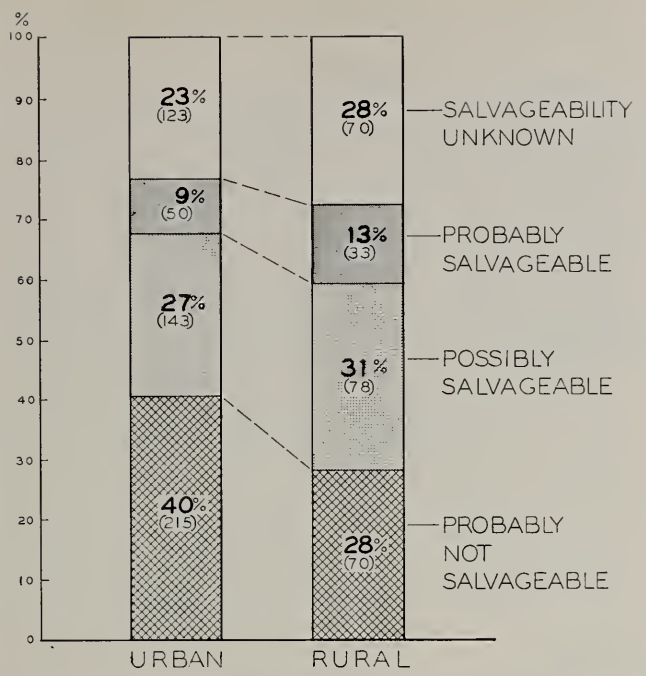


Chart 3.—Estimated salvageability of injury causing death in urban and rural California traffic fatalities, 1961.

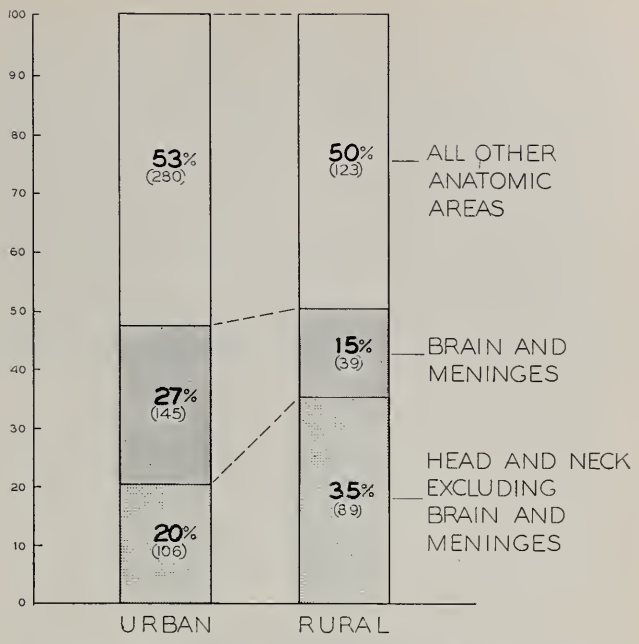


Chart 4.—Proportion of traffic fatalities from injury to head and neck excluding brain and meninges, and from brain or meninges injury only, in urban and rural California counties, 1961.

Question 3: Is the higher case fatality ratio in rural counties explained by factors occurring after the accident has happened, such as delay in discovering the accident, difficulty in getting emergency medical care to the scene of the accident, greater distances from hospital facilities, and perhaps less specialized rescue and medical facilities of all types than might be found in urban areas?

While the death certificate contains no specific information about the time lapse before an accident is discovered, analysis of the data available did yield some suggestive facts. No matter what hour of the day the injury occurred, 85 to 90 per cent of the fatally injured in urban counties were urban residents. In contrast, between the hours of 6 p.m. and midnight 75 per cent of the rural injuries were to rural residents, but during the next six hours, until 6 a.m. only 58 per cent were to rural residents (Table 3). It is reasonable to assume that accidents occurring during the early hours of the morning are less likely to be discovered immediately, especially if they involve people whose presence in the county is not known or expected. In addition, in many accidents it is possible for one of the less injured occupants to seek aid. The chances for this occurring would be greater in a two car collision than in a single car collision, which was the more frequent type in rural counties.

Injuries to the head, chest and abdomen were the primary cause of almost 90 per cent of fatalities in both urban and rural areas. Although the distribution of injuries among these three anatomic areas was essentially the same in both urban and rural counties (Chart 2) only 38 per cent of the injuries occurring in rural counties were considered not to be salvageable, while 53 per cent of those in urban counties were so classified. In approximately 25 per cent of the deaths in both areas it was not possible to estimate salvageability because of inadequacy of information on the death certificate (Chart 3).

TABLE 4.—*Proportion of Deaths Occurring at Given Time Intervals After Injuries to Specific Anatomic Areas in Urban and Rural California Traffic Fatalities*

Survival After Injury	Chest		Abdomen		Head and Neck Excluding Brain and Meninges		Brain and Meninges	
	Urban Per Cent	Rural Per Cent	Urban Per Cent	Rural Per Cent	Urban Per Cent	Rural Per Cent	Urban Per Cent	Rural Per Cent
Under 1 hour	59	75	46	50	69	80	55	56
1 to 4 hours	21	13	17	43	12	12	12	8
5 to 24 hours	7	2	10	7	8	0	12	10
Over 25 hours	14	9	27	0	12	8	21	26
Total per cent	100	100	100	100	100	100	100	100
Total numbers	169	85	41	14	106	89	145	39

The difference between urban and rural is especially apparent with injuries to the head and neck. Fatalities from these injuries in urban counties were much more frequently the result of damage to the brain and meninges than in the rural counties. (Chart 4). Also it was noted that people injured in rural accidents tended to die more rapidly than those in urban accidents from injuries to chest, abdomen and head, excluding brain and meninges, but showed no difference in time of survival where the primary cause of death was brain or meningeal damage (Table 4).

Ninety per cent of the fatalities occurring during the first hour after injury in rural counties were at the scene of the accident. Only 37 per cent of those dying in the same time interval after urban accidents had not been moved from the scene. Those rurally injured who were moved before death frequently were taken over 25 miles from the place of injury, but almost all of the fatally injured in urban counties reached hospitals within 10 miles of the accident (Table 5).

Discussion

It would appear from the data that the proportion of the severe types of vehicular accidents is higher in urban than in rural areas. Therefore the explanation for the higher case fatality ratio in rural counties probably cannot be found in the assumption that rural accidents involve more severe impacts. The answer seems to lie in the factors which occur after the accident has happened.

By their very nature, rural accidents are less likely to be immediately discovered. Rural accidents more frequently involve only a single vehicle. Those occurring in the early hours of the morning when the roads are least heavily traveled tend to involve nonrural residents whose absence or excessive delay in arriving home would arouse no concern among friends or relatives in the immediate vicinity of the accident.

Once a rural accident is discovered, transportation to a source of definitive medical care is harder to obtain, as indicated by the fact that, despite less severe injuries, 90 per cent of the deaths in rural counties within one hour after injury occurred at the scene of the accident, while only 37 per cent of urban deaths in the same interval were at the scene. The additional factor of greater distance from a hospital in rural accidents further compounds the problem.

As to injuries (such as to the brain) where it can be postulated that early and adequate medical care will be of only limited usefulness, no difference could be found between urban and rural fatalities in the time interval between injury and death. However, in every case where it could be postulated that early and adequate care might delay or prevent death, death in rural counties takes place sooner than in the urban counties. This is especially striking with regard to injuries to the head and neck without brain or meningeal damage. Such injuries often result in aspiration of blood, vomitus or dentures and in edema and instability of mouth and neck structures. It therefore is felt that many of the deaths from injuries of this kind may have been due simply to inadequate maintenance of airway and respiratory mechanisms, perhaps because the injured person was not found soon enough, or perhaps because there was no one in constant attendance during transportation to the hospital or the person in attendance at the scene or during transportation was not adequately trained in the procedures necessary to provide respiratory assistance.

Much attention has been focused in recent years on the difficulties in obtaining sufficient rural medical resources. The number of physicians per 1,000 resident population has consistently been lower in less densely populated areas. This study further emphasizes the medical burden of the rural area, since it not only must care for its own sick and injured with fewer physicians and fewer hospital beds, but also must handle a comparatively larger influx of injured transients than is likely to be encountered in urban communities.

TABLE 5.—*Distance Patient Was Transported Before Death, as Related to Various Time Intervals of Survival, in Traffic Fatalities Occurring in Urban and Rural California Counties, 1961*

Distance Transported Between Injury and Death	Duration of Survival: Under 1 Hour Per Cent	1 to 4 Hours Per Cent	Over 5 Hours Per Cent
Died at scene of accident			
Urban	37	2*	1*
Rural	90	11	0
Under 10 miles			
Urban	59	83	77
Rural	9	61	43
10 to 25 miles			
Urban	3	10	11
Rural	2*	18	24
Over 25 miles			
Urban	1*	4*	11
Rural	0	11*	32
Total			
Urban (per cent)	100	100	100
Urban (numbers)	310	90†	128†
Rural (per cent)	100	100	100
Rural (numbers)	183	28†	37

*Based on fewer than 5 deaths.

†In an additional 6 cases distance between site of injury and site of death was unknown.

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Self-Retaining Retractor Support

New Applications

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■ *A retractor support consisting of an inverted L-rod, fastened to the operating table with a clamp, can be applied in a variety of ways to maintain retraction more conveniently and reliably in some circumstances than a human assistant. Through universal joints and connecting rods it can be quickly adjusted to hold a Weinberg retractor, a BiBall retainer, a rectangular frame for multidirectional retraction in vascular repair, or a ribbon retractor for herniotomy, pneumonectomy and lobectomy. By freeing the assistant this device can shorten operating time and permit cumbersome procedures to be accomplished by a surgeon and one assistant with less operative trauma.*

NEW ATTACHMENTS and new uses have been developed for a previously reported apparatus[1,2] that holds surgical retractors and other instruments under tension and otherwise serves as "extra hands" for a surgeon.

The primary unit is a support—an inverted "L" stainless steel rod. The vertical limb of the "L" is clamped to the side rail of the operating table at any point while the horizontal limb extends over the operating field to retain universal joints that hold appliances at almost any angle and in almost any plane. For such purposes as abdominal retraction this equipment does not crowd the surgeon as an extra assistant might, and it can maintain traction steadily for longer periods than can a human assistant. It does not shift, move or relax at crucial moments, yet by a simple adjustment it can be moved to apply traction at another angle or to hold viscera from the operative field as the surgeon wishes.

One use for the apparatus is to hold the Weinberg retractor, an instrument that greatly facilitates operative procedures in the upper left quadrant but is so heavy and cumbersome that ordinarily an additional surgical assistant is needed to apply it with the proper traction. (See Figure 1.) A steel rod of quarter-inch diameter is attached to the retractor handle by a clamp applied with two wing bolts; this short rod carries a ¼″ x ¼″ universal joint. If applied in the following steps, the Wein-

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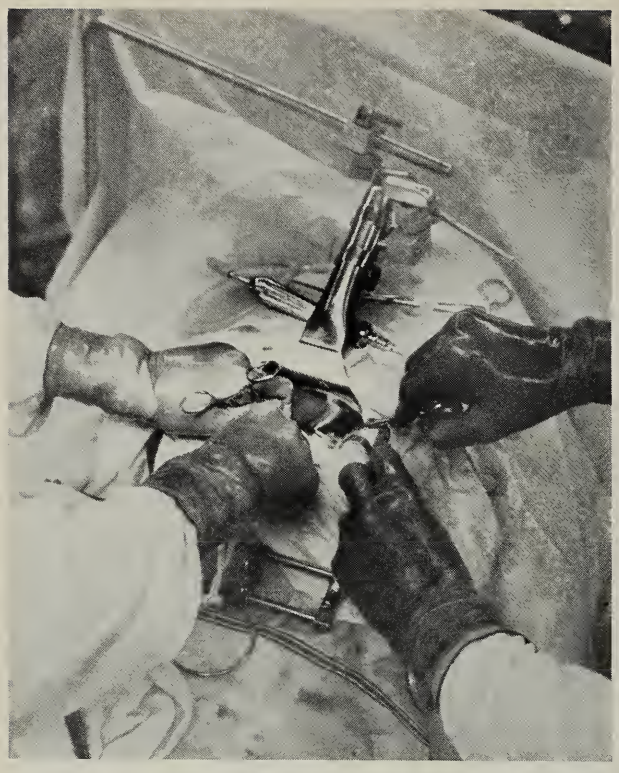


Figure 1.—With the Weinberg retractor held in place mechanically, the assistant has two hands available for delicate surgical work required.

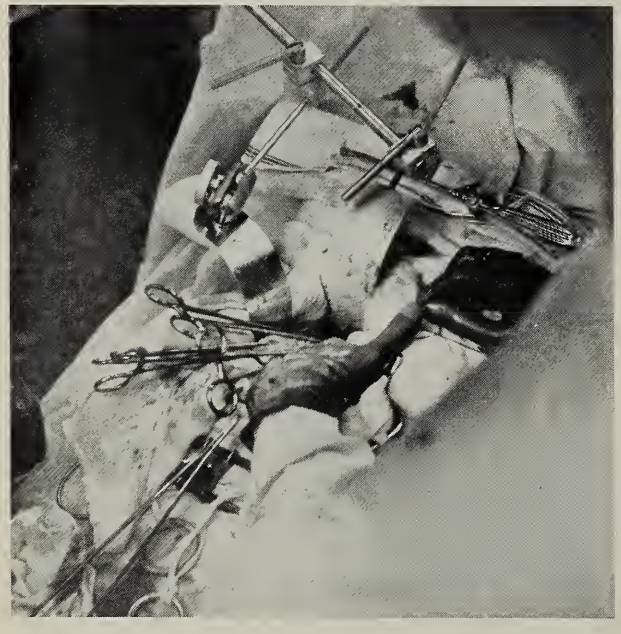


Figure 2.—BiBall controlled retractor. Steel ball on ¼ inch rod is linked by BiBall to Crile blade with steel ball on spud.

berg retractor can be adapted to the individual situation with proper stress and balance:

The base clamp is attached beforehand to the side rail of the operating table in the patient's nipple line. When the retractor is needed, an assistant can insert the support and set it three or four inches above the patient's chest, then slide on a universal joint. The retractor, with the holder and the other universal joint attached to it, is applied by the surgeon for optimal exposure and held in place while the assistant connects the joints with a quarter-inch steel rod. Before this is locked, the surgeon pulls on the support rod toward the retractor with equal force so that parts are held in line and in tension. The entire procedure may take a minute. Thereafter the table must not be flexed or extended until a joint is released.

For this, as for other procedures, all equipment can be sterilized in one wrap for ready availability. All joints should be slightly loose to allow for differences of expansion in heat.

The BiBall—An Extra Hand

More adaptable retraction is obtained with the BiBall mechanism, a double-jointed ball-and-socket. The socket is in the form of a short pipe split in two; the two semi-cylinders are pulled together with a knob screw to clamp about two steel balls. One ball is welded by a short neck to a Crile blade or other appliance; the other is on a rod that goes to a universal joint on the support arm. The ball necks can be fixed at a great range of angles between the semi-cylinders.

At repair of a hiatus hernia the liver may protrude into the operating field even though the Weinberg retractor has been accurately placed; at cholecystectomy the liver may hide the deepest part of the wound. The BiBall mechanism permits introduction of an additional retractor that does not get into the surgeon's way (Figure 2).

Abdominal Vascular Repair

In resection and grafting of the abdominal aorta, fatigue of the surgeon and his assistant is a danger to be considered. The Thompson equipment developed for this operation not only helps to assure the maximum exposure but in most cases makes it unnecessary to have more than one assistant.

For this purpose, the support arm and three aluminum rods are joined in a rectangle over the operative field by means of four universal joints, which when sufficiently tightened do not allow the framework to sag and press on the patient's thighs even when used to support and steady the surgeon's arm (Figure 3). Further rigidity may be added by attaching a second support rod at the lower end of the framework. Retractors attached by joints on any of the four bars can pull in any direction.

This aortic resection retractor set can be assembled beforehand and sterilized with all joints in place and the retractors wrapped in the center of the framework. At operation it need only be in-

serted into the base clamp and adjusted to the field. Some surgeons may prefer to assemble only the equipment needed for a given procedure; in any case the most complicated arrangement requires only a minute or two. The time saved by perfect retraction amply rewards the surgeon who perfects his technique in various uses of the equipment.

Surgeons have found it desirable to have at least the following available:

3—2x8-inch Crile blades	8-inch handles
2—2x4-inch Crile blades	4-inch handles
1—1x8-inch Crile blade	8-inch handle
1—medium modified Richardson	8-inch handle
1—Bifid retractor	8-inch handle

Holder for U.S. Retractor*

At the request of an otolaryngologist, a special holder was devised for the U. S. retractor to be used in antrotomy. Later it proved especially useful in an endarterectomy in which the renal artery was covered by a large vein (Figure 4). By providing the steady and precise retraction, this device gave the surgeon room to work with assurance that the vein would not be torn.

For this purpose one end of a quarter-inch rod is formed into an eye. A wing bolt is passed through this eye and between the bars of a U. S. retractor to fasten them at the desired angle. The rod is then fixed to the support arm by two universal joints. For a Caldwell-Luc operation the holder is attached directly to the support arm by a single universal joint.

Ribbon Retractor

At transthoracic repair of a diaphragmatic hernia, exposure was maintained with a single ribbon retractor which held the upper leaf of the diaphragm and prevented the abdominal contents from pressing the diaphragm into the field of operation. When the assistant is relieved of maintaining such retraction, the operating time is considerably reduced. The same means has been used to facilitate pneumonectomy and lobectomy.

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REFERENCES

1. Thompson, R. C.: A new self-retaining abdominal wall retractor, Am. J. Surg., 103:597-598, May, 1962.

2. Thompson, R. C., and Neff, W. B.: Mechanical aids at the operating table, Calif. Med., 97:28-30, July, 1962.

*U.S. Army Retractor made by a number of instrument manufacturers.



Figure 3.—Retractor for abdominal aortic resection. A rectangular framework of variable size accommodates an abdominal incision of maximal length. That the retractor can be rotated and angulated for precise application offers a distinct advantage for optimal retraction. Also it can either elevate or depress the wound margin.

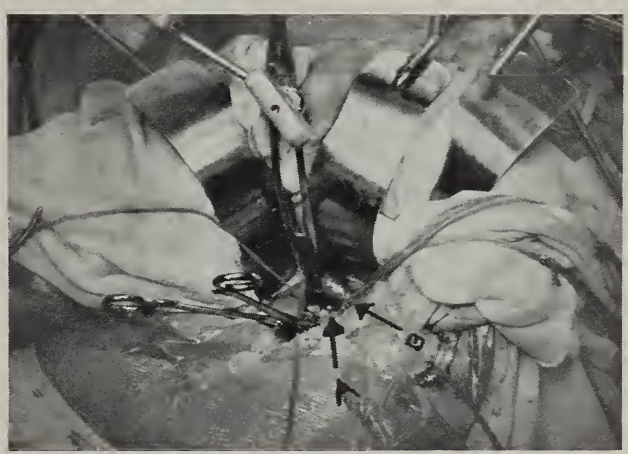


Figure 4.—U.S. retractor (Army) holder showing winged handle bolt and ¼ inch rod. Arteriosclerotic plaque in renal artery (A) was completely covered by the large vein (B).

Cancer of the Prostate Gland

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THE REPORTED INCIDENCE of carcinoma of the prostate gland has shown a decided increase within the past half century. Today we know that the actual incidence rises sharply beyond the age of sixty[6,22] and some of the increase may be attributable to increased longevity. A greater factor, however, is the present-day careful examination of elderly males. A better understanding of the prostate gland and problems associated with it is now general, both amongst physicians and patients.

The cause of carcinoma of the prostate gland is not known. The important contributions of Huggins and his collaborators have indicated that it is an hormonal-dependent disease.[10]

Pathology

The prostate gland is composed of two areas. The inner or periurethral group of cells are largely responsible for the development of benign hyperplasia, and the peripheral or posterior group give rise to 75 per cent of the malignant processes.[18] That carcinoma may arise in any portion of the gland is indicated from the studies of Kahler[15] and others. It is usually slow growing. Extension within the gland takes place by continuity and by spread through invasion along the perineural lymphatic spaces.

Microscopically, most malignant lesions of the prostate gland are adenocarcinoma. Diagnosis depends upon a careful study of the cell pattern and the presence of perineural lymphatic invasion. The not infrequent finding of nests of malignant cells within blocks of tissue removed surgically for supposedly benign obstruction (the so-called "occult carcinoma") indicates the necessity for careful examination of surgical specimens.

The symptoms of prostatic carcinoma depend upon the extent of the process when first presented. In the early stages of the disease there are, unfortunately, none that point to its presence. As the lesion develops, the urinary complaints are in direct proportion to the degree of obstruction. Where pain is present this usually indicates extension to bones or soft tissue.

Diagnosis

Due to the scarcity of symptoms and the present lack of any definitive diagnostic tests, the early detection of prostatic carcinoma depends upon careful and intelligent rectal palpation. In our opinion, males over fifty years of age should have a rectal examination done every six months. We cannot overemphasize the value of precise records of these examinations. In these, the physician must consider the consistency of the gland, its outline, the degree of fixation and evidence of extension to the seminal vesicles. Variations from normal may be caused by other processes besides carcinoma. Any prostate gland that does not feel completely within the limits of normal should arouse the suspicion of the examiner and lead to further investigation.

Laboratory aids are of little help in the detection of early carcinoma. A recent study[11] suggests that the difference in the rate of absorption of radioactive phosphorus (P^{32}) by benign and malignant cells may prove useful in detecting early involvement. In late cases the serum acid phosphatase level, by either the total or fractional method, is an important corroborative test and a sensitive supplementary indicator of metastasis to bone.[10] Cellular stains of prostatic secretion by the Papanicolaou method have not proved of significant value.[9]

X-ray examination must include films of the pelvis and lumbar spine. The earliest bone metastasis is usually to these areas. Such lesions are commonly osteoblastic and must be differentiated from Paget's disease and osteoarthritic changes. Widespread metastasis may be seen in any of the bones, but involvement may be caused by other forms of malignant disease.

Cystourethroscopy is, as times, helpful in differentiating carcinoma from benign hyperplasia. With malignancy the urethra is decidedly rigid.

To appear as part of the revised Cancer Studies.

Once the presumptive diagnosis suggests carcinoma, it may be established by acquiring biopsy specimens for histological confirmation. This should be done in order to justify the program necessary for the management of the disease.[10] There are several methods for obtaining prostatic tissue for biopsy. We prefer the open perineal biopsy. Some surgeons advocate the retropubic approach. If the patient falls into the group of 10 per cent or less who present evidence that the process, if proved malignant, could be handled by total extirpation of the prostate and seminal vesicles, then the radical procedure may be done at once. Frozen sections are usually satisfactory for these examinations.[5]

Needle biopsy has proved successful in a high percentage of cases. Perineal biopsy is performed by inserting the needle through the perineum and into the prostate.[16] We prefer this approach. The transrectal biopsy is done with the aid of a proctological speculum to isolate the area. The needle is passed through the rectal wall directly into the suspected nodule.[7] Transurethral resection is not advocated in early involvement, but in late cases where such a procedure is necessary to relieve urinary obstruction, the material obtained will usually be adequate to establish the presence of a malignant lesion.

Treatment

In the treatment of carcinoma of the prostate gland it is extremely important to individualize the management of each patient. In early cases, total extirpation of the gland and seminal vesicles will often prove effective. In advanced cases a great deal of relief may be given by endocrine management. Radiation therapy may be of help.

Radical surgical removal of the prostate was developed by Young in 1904.[24] Various modifications of the original procedure have been introduced. The subsphincteric approach of Belt has, we believe, an advantage over the classical Young exposure.[1] The radical retropubic prostatectomy was described by Millen in 1947.[17] This plan of approach has one advantage over the perineal, in that the pelvic and preaortic nodes may be excised. The significance of these nodes has been stressed by Flocks and Culp.[8]

The hormonal treatment of prostatic carcinoma represents one of the dramatic achievements in the management of human malignant disease. While sporadic attempts had been made to modify prostatic growth by curtailing testicular function and by using estrogens, it remained for Charles Huggins and his collaborators to apply findings, developed in experimental animals, to men with prostatic malignant disease. The acceptance of the likelihood that neoplastic cells would respond in the same fashion as normal prostatic tissue formed the basis for the employment of orchiectomy and estrogen therapy. This response has now become established.[10,12]

In patients with advanced carcinoma of the prostate the initial hormonal treatment employed has usually been the administration of an estrogen, surgical castration, or a combination of both. At this time, there is no clear-cut evidence regarding the sequence with which these two methods should be employed. As knowledge accumulates with respect to relapse, it would seem that the degree of involvement and incapacity of the patient should be the factor in outlining the program of treatment. There is evidence that castration is more effective in producing improvement in patients who have relapse after estrogen therapy than the reverse.[20]

The initial administration of estrogens is usually readily accepted by the patient. However, the response is slower than to castration. The most troublesome complications are gynecomastia, gastrointestinal irritation and fluid retention. Intestinal irritability can often be helped by varying the dose or type of drug employed. Fluid retention may be helped by salt restriction or by periodic curtailment of treatment. This complication becomes of importance mainly in the treatment of the patient who also has heart disease.

Gynecomastia is an almost universal occurrence and the patient should always be warned of it before treatment is begun.

There are numerous forms of estrogens available. Diethylstilbestrol is a short-acting, effective inexpensive oral preparation which is in most common use. The usual dosage is 5 mg daily. It is our practice to give the patient a loading dose of 15 mg daily for the first month, then decrease the amount according to the clinical response or the patient's ability to handle the drug. Another oral preparation in considerable use is chlorotrianisene (Tace-Merrell). This is given in doses of 12 or 24 mg twice daily. It is reputed to produce less side effects than stilbestrol.[3] For patients unable to tolerate oral medication, or who neglect to take it, polyestradiol phosphate may be given parenterally. This is a long-acting drug. The suggested dose is 40 mg every four weeks.

Where rapid suppression of testicular androgens is necessary, orchiectomy is indicated. There are several procedures available and none of them offers therapeutic advantage over the others.

While the initial responses to hormonal therapy are dramatic, there is little evidence that this treatment actually cures prostatic malignant disease. Relapse from antiandrogenic therapy was first noted by Huggins.[13] He immediately began a search for the source of extragonadal androgens. The adrenal glands and the hypophysis have both been found to have an influence on the production of androgens.

The role of these glands has been under intensive study both with regard to extirpation and to modification of their action.[10,14,21,23]

Radiation Therapy

Since the discovery of x-rays in 1895 and of radium in 1898, both have been used in the attack on cancer. Both have been successful in modifying to some extent the growth of some malignant cells. They have more frequently helped in the palliation of pain.

The availability of radioactive isotopes has increased the use of x-radiation in the treatment of prostatic carcinoma. Gold (Au^{198}) and chromic phosphate (P^{32}) has been used by several investigators.[2,8,19] The distribution of the radioactive material upon injection has presented many problems. Use of these agents is still experimental and should, we believe, be restricted to those institutions where adequate control and evaluation may be accomplished.

The use of Cobalt 60 has, again, demonstrated the value of direct radiation. This form of therapy may be used in combination with surgical operation, isotope injection and experimental chemotherapy.

It is now over a half century since carcinoma of the prostate was first subjected to direct attack. The biological potential of carcinoma is still unknown. The treatment of all patients must be individualized and adapted to give the maximum of palliation with the minimum of discomfort and side effects.[10]

Sarcoma of the Prostate

Sarcoma of the prostate gland is an uncommon disease. Formerly thought to afflict only the young, it has now been found in all ages. Many varieties of sarcoma have been described. Histological differentiation is often unsatisfactory. The term *sarcoma of the prostate* seems to be rather loosely used. Whether or not the tumor arises from the prostate gland or the retrovesicle area is, we believe, of little consequence. The process rapidly involves the prostate and seminal vesicles, pushing up into the pelvis and obstructing urination. Metastatic spread is by extension through lymphatic channels and to the liver and lungs by way of the bloodstream. Metastasis to bones is rare.[4]

Symptoms are usually those of urinary obstruction. Rectal examination reveals a large, rounded, relatively soft mass which rapidly fills the pelvis. Diagnosis is confirmed by biopsy.

Treatment is unsatisfactory. Surgical operation is usually limited to suprapubic cystotomy. Radiation, either by x-rays or radium, has helped in some cases. The prognosis is poor with any form of treatment.

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REFERENCES

1. Belt, E., Ebert, C. E., and Surber, A. C., Jr.: A new anatomic approach in perineal prostatectomy, J. Urol., 41:482, 1939.

2. Buckley, G. J., Cooper, J. A., and O'Conor, V. J.: Intraprostatic injections of radioactive colloids: II, Distribution within the prostate and tissue changes following injection in the dog, J. Urol., 72:476, 1954.

3. Carroll, G., and Brennan, R. V.: TACE in prostatic cancer: Clinical and biochemical consideration, J. Urol., 72:497, 1954.

4. Colby, Fletcher H.: Essential Urology. 4th Edition. Williams and Wilkins Co., Baltimore, 1961. Chapter VI: Diseases of the prostate.

5. Culp, O. S., and McDonald, J. R.: Importance of frozen sections in evaluating prostatic nodules, J. Urol., 72:443, 1954.

6. Dean, A.: Carcinoma of the prostate, Bull. N.Y. Acad. Med., 23:454, 1947.

7. Emmet, J. L., Barber, K. W., Jr., and Jackman, R. L.: Transrectal biopsy to detect prostatic carcinoma: A review and report of 203 cases, J. Urol., 87:460, 1962.

8. Flocks, R. H., and Culp, D. A.: Radiation Therapy of Early Prostatic Carcinoma, Charles C Thomas, Springfield, Illinois, Baltimore, Md., 1960.

9. Frank, I. N., and Scott, Winfield, W.: The cystodiagnosis of prostatic carcinoma: A follow-up study, J. Urol., 79:983, 1958.

10. Grayhack, J. T.: Hormonal treatment of prostatic cancer, Surg. Clinics of N.A., 39:1, 13, 1959.

11. Haskins, M. E., Wagner, M. L., Ivker, M., and Widman, B. P.: The early diagnosis of prostatic malignancy by the use of P^{32}, Am. J. Roentgenol., 85:99, 1961.

12. Higgins, C., and Hodges, C. V.: Studies on prostatic cancer: I. The effect of castration, of estrogen and of androgen injection on serum phosphatases in metastatic carcinoma of the prostate, Cancer Research, 1:293, 1941.

13. Huggins, C.: Prostatic cancer treated by orichietomy: The five year results, J.A.M.A., 131:576, 1946.

14. Huggins, C., and Scott, W. W.: Bilateral adrenalectomy in prostatic cancer. Clinical features and urinary excretion of 17-ketosteroids and estrogens, Ann. Surg., 122:1031, 1945.

15. Kahler, James E., Jr.: Carcinoma of the prostate gland: A pathological study, J. Urol., 41:557, 1939.

16. Kaufman, J. J.: Rosenthal, M., and Goodwin, W. E.: Methods of diagnosis of carcinoma of the prostate: A comparison of clinical impressions, prostatic smear, needle biopsy, open perineal biopsy and transurethral biopsy, J. Urol., 72:450, 1954.

17. Millen, T.: Retropubic Surgery, E. & E. Livingstone, Ltd., Edinburgh, 1947. Chapter XVII, Carcinoma of the prostate, p. 152.

18. Moore, Robt. A.: The morphology of small prostatic carcinoma, J. Urol., 33:224, 1935.

19. Rusche, C., and Jaffe, H. L.: Treatment of prostatic carcinoma with radioactive colloidal chromic phosphate (P^{32}): A preliminary report, J. Urol., 72:466, 1954.

20. Scott, W. W.: Urology, edited by M. Campbell, W. B. Saunders Co., Philadelphia, 1954. Carcinoma of the prostate, Section X, Chapter 5, p. 1125.

21. Scott, W. W.: Endocrine management of disseminated prostatic cancer, including bilateral adrenalectomy and hypophysectomy, Tr. A. A. Genitourinary Surg., 44:101, 1952.

22. Whitmore, W. F., Jr.: Hormone therapy in prostatic cancer, A. J. Med., 21:697, 1956.

23. Whitmore, W. F., Jr., Randall, H. T., Pearson, O. H., and West, C. D.: Adrenalectomy in the treatment of prostatic cancer, Geriatrics, 9:64, 1954.

24. Young, H. H.: The early diagnosis and radical cure of carcinoma of the prostate, Johns Hopkins Med. Bull., 16:315, 1905.

25. Young, H. H.: The cure of cancer of the prostate by radical perineal prostatectomy: History, literature and statistics of Young's operation, J. Urol., 53:188, 1945.

CASE REPORTS

False Endocrine Test Results Due to Drugs

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THIS REPORT is intended to call attention to two observations previously recorded but not widely known: 1) Aspirin administration reduces the serum protein-bound iodine level and 2) meprobamate administration will result in a urinary chromogen which causes a falsely high 17-ketosteroid and 17-hydroxysteroid reading. A similar problem occurs with ethinamate (Valmid®). The following is a case in point.

Report of a Case

A 56-year-old caucasian man had been under medical care for three years because of syncopal attacks and at least two generalized seizures. He had been diagnosed as having Stokes-Adams syndrome due to intermittent cardiac arrest following myocardial infarction. There was a history of alcoholism up until seven years ago and of much bariturate ingestion recently. His wife said that he had poor memory and poor judgment. The patient complained of "inner shakiness." On my initial examination he appeared pale and apathetic. He was a tall, bent man with a large calvarium, and his facial skin folds hung loosely in a fashion reminiscent of a boxer dog. His speech was slow, his tongue large and his skin mildly dry. There was some finger clubbing, which was thought to be familial.

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Chronic barbiturate intoxication or hypothyroidism were considered. Protein-bound iodine (PBI) levels on three occasions were 3.0, 3.2, and 3.5 mcg per 100 ml. Because panhypopituitarism was suspected, urinary steroid determinations were carried out. These were, to our surprise, very high on initial and repeated study. The 24-hour excretion was 62 mg of 17-ketosteroids and 25 mg of 17-hydroxycorticosteroids. As the patient was considered unreliable, unacknowledged ingestion of drugs or improper collection of urine specimens were good possibilities, and he was put in hospital at the UCLA Medical Center for further study.

Two days after admission he had a generalized seizure. The blood content of phenobarbital at that time was 6.9 mg per 100 ml and the meprobamate content was 0.04 mg per 100 ml. Because the seizure was believed to be due to drug withdrawal, phenobarbital was administered and there were no further convulsions. Urinary steroid content, determined the following day was still high. No drugs were found on a search of the patient's belongings, but we later learned from the patient's wife that he had been hiding meprobamate and aspirin on the bottom of a box of facial tissue and was taking them surreptitiously. A search at home disclosed that, at least until the time of admission, the patient had access to large stores of ethinamate (Valmid®). A week later when the patient was receiving no drugs the steroid levels were within normal range. The PBI level at the time of admission to hospital was 2.0 mcg per 100 ml. One week after definite drug withdrawal it was 3.4 mcg and the T_3 uptake in red cells was 17.3 per cent (normal, 10.3 to 14.3 per cent). Four weeks later, when the only known drug ingestion for two weeks was phenobarbital, the PBI was 3.8 mcg per 100 ml and the I^{131} uptake was 11 per cent at 6 hours and 19 per cent at 24 hours (normal). At last report the patient was again taking large doses of aspirin (3 to 6 grams a day) and no further studies were done.

Discussion

Depression of thyroid function by salicylates was studied in detail by Austen and co-workers.[1] They observed that sodium salicylate given in doses of

6 to 8 grams per day for eight to fifteen weeks caused: 1) increased oxygen consumption and basal metabolic rate, negative nitrogen balance and loss of weight; 2) decreased PBI into the hypothyroid range, the lowest recorded being 3.1 mcg per 100 ml; 3) decreased I^{131} uptake by the thyroid gland, although usually not into the "hypothyroid" ranges. From these and other studies they concluded that salicylates increased cellular metabolism but depressed thyroid function, presumably by way of the pituitary gland or higher brain centers.

Other work indicates that protein-bound iodine is lowered because salicylates compete for binding sites on serum proteins, thus increasing the free thyroxin portion and the uptake of T_3 by red cells.[3] Pressman and Sklaroff[4] studied the effect of meprobamate on thyroid function in eight patients for 21 to 30 days and concluded that there was no effect. However, in five patients the PBI was reduced and in one into the "hypothyroid" range.

Meprobamate and ethinamate excretion in the urine produce a color development which is so close to that produced by the 17-keto and 17-hydroxysteroids that the level of steroid excretion may appear falsely high. Borushek and Gold[2] pointed out that many antihypertensive agents, monoamine oxidase inhibitors and soporific, tranquilizing and psychic energizing drugs interfere with accurate measurements of urinary steroids.

Summary

A case report is presented of a man whose surreptitious ingestion of aspirin, meprobamate and ethinamate led to low serum levels of protein-bound iodine and high urinary steroid levels. His wife's detective efforts helped to resolve a problem of what appeared to be bizarre endocrinopathy.

All drug administration should be discontinued before endocrine studies are done. When incredible results are obtained, secret ingestion of drugs should be suspected.

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REFERENCES

1. Austen, F. K., Rubini, M. E., Meroney, W. H., and Wolff, J.: Salicylates and thyroid function.—I. Depression of thyroid function, J. Clin. Invest., 37:1131-1143, 1958.

2. Borushek, S., and Gold, J. J.: Commonly used drugs that interfere with routine endocrine laboratory procedures, Clin. Chem., 10:41-52, January, 1964.

3. Osorio, C.: Effect of salicylate and dinitrophenol on the binding of thyroid hormones by human and rat serum proteins at pH 7.4, J. Physiol., 163:151-159, 1962.

4. Pressman, R. S., and Sklaroff, D. M.: Effect of meprobamate on thyroid function, J. Einstein Med. Center, 9:235-237, October, 1961.

Idiopathic Rhabdomyolysis

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ACUTE SPONTANEOUS degeneration of skeletal muscle is a rare, poorly understood phenomenon frequently associated with renal tubular damage secondary to myoglobinuria. It was first described by Meyer-Betz in 1911.[11] The name *Rhabdomyolysis*, suggested by Bowden and coworkers,[3] to replace the term *paroxysmal myoglobinuria,* focuses attention on the primary site of the disorder, but the nature of the pathologic change in the muscle remains obscure.

Muscle necrosis due to trauma (crush syndrome) and ischemia may cause significant myoglobinuria, but the concern here is with the more baffling spontaneous release of myoglobin which has occurred in a wide variety of circumstances. Exercise is the precipitating factor in about 50 per cent of the reported cases, and in a very few of these a specific enzyme deficiency—lack of muscle phosphorylase (McArdle's syndrome)—has been demonstrated.[10,14] Alcoholism,[6] barbiturate intoxication,[6] potassium depletion,[8] disturbed carbohydrate metabolism,[7] ingestion of fish from industrially contaminated waters in East Prussia (Haff disease)[1] are some of the other conditions that have been associated with the syndrome of spontaneous muscle tenderness and myoglobinuria. Whether these diverse clinical situations represent different etiologic derivation or are merely factors precipitating a final common pathological mechanism remains to be seen.

In the recurrent cases several observations suggest an inherited predisposition. A high familial incidence of muscular dystrophy was noted in one series,[5] and recently elevated serum levels of muscle enzymes were demonstrated in an asymptomatic sibling of a patient with rhabdomyolysis.[13] The very specific deficiency of McArdle's syndrome is probably due to a genetic defect. In cases with one isolated attack, however, acquired factors seem more likely than inherited defects.

Molecular abnormality in the myoglobin as an etiological factor may be a possibility even though

Submitted January 15, 1964.

the excreted myoglobin seems to be normal in most cases. The recent demonstration of urinary fetal myoglobin in one case[2] and unusual urinary heme pigments in another[9] keeps the question open for further investigation.

In the case reported herein there was no obvious precipitating cause and it was unusual in that there was unilateral localized muscle involvement and associated sciatic nerve palsy. Hemodialysis was necessary to sustain life during recovery from myoglobinuric kidney damage.

Report of a Case

A 39-year-old white man felt well upon retiring the evening of February 21, 1963, but recalled that he had been unusually thirsty all day. When he awoke the next morning his right thigh was painful and his right leg felt numb from mid-thigh down. He collapsed when he got out of bed because the leg was paralyzed. By afternoon his urine was scanty and colored dark brown. The leg became more painful and he vomited several times. On examination of the patient at home it was noted that the right thigh was swollen and tender and the leg was flaccid from the hip down. He was admitted to Alta Bates Community Hospital, Berkeley.

In 1958 the patient had had infectious hepatitis without subsequent jaundice or known impairment of liver function. There was a history of peptic ulcer without complications or recent symptoms. He gave a history of hives following a penicillin injection and uncertain kinds of minor reactions to erythromycin, morphine and procaine but no other definite allergic manifestations. In 1961, following an accidental burn on the hands, staphylococcal skin infection developed and he had recurrent superficial abscesses of the arms and legs, requiring several incisions with drainage. Late in the same year staphylococcal septicemia developed and kanamycin (Kantrex®) was administered with good results, but later the patient had recurrent boils.

Three days before the onset of the present illness he received injections of polyvalent influenza vaccine, vitamin B^{12} and a smallpox vaccination, all in the shoulders. He denied ingestion of alcohol or drugs and said he had had no strenuous exercise or trauma before the illness. He was at work as an accountant the day before. There was no known muscular disease in the family.

The patient was well-developed and well-nourished, appeared to be in acute distress and was perspiring freely. He complained of severe pain in the right thigh and lower part of the right buttock. The blood pressure was 130/90 mm of mercury, the pulse 88 beats per minute and regular, and the temperature 97.8°F. The skin was cool and moist and showed many scars from previous boils on the arms and legs, but there was no evidence of active infection. Early arcus senilis was noted in the eyes, but they were otherwise normal. No abnormalities were detected in the examination of the ears, nose, throat, lymph nodes, lungs, heart, abdomen, genitalia and rectum. The right thigh was several centimeters larger in circumference than the left, with swelling extending from the gluteal fold almost to the knee, most noticeable posteriorly. The thigh muscles felt soft and almost fluctuant. All sensation was lost from about the midthigh down, and except for rotatory hip motion there was flaccid paralysis of the leg and foot. Some hypesthesia was noted medially at the inguinal ligament and extending to the right side of the scrotum. Tendon reflexes were present and equal bilaterally at the knee, but the right ankle jerk was absent. The femoral pulses were strong bilaterally but the right popliteal pulse was weaker than the left and diminished arterial pulse in the right calf was confirmed by oscillometry. Pedal pulses could not be felt in either foot. The right foot was cooler than the left. In view of the history of recurrent staphylococcal disease, the initial impression was possible deep abscess of the thigh and buttock with compression of the femoral artery and the sciatic nerve.

X-ray films of the abdomen and both thighs showed no abnormalities.

The hemoglobin was 17.5 gm per 100 ml and the packed cell volume 49 per cent. Leukocytes numbered 20,200 per cu mm 80 per cent segmented, 15 per cent banded forms, 4 per cent lymphocytes and 1 per cent monocytes. The blood sugar was 100 mg per 100 ml and the serum creatinine 3.6 mg per 100 ml. The urine was dark brown but with colorless foam. The pH of the urine was 6 and it contained 4+ albumin, a trace of glucose and no acetone. The benzidine test on the urine was positive for blood. On microscopic examination, the urinary sediment showed a very few red blood cells, 4 to 8 leukocytes per high power field and many broad, darkly pigmented amorphous casts. Both myoglobin and hemoglobin were found in the urine by the ammonium sulfate precipitation technique.[12] Paper electrophoresis on the same specimen three days later failed to separate myoglobin, probably because of changes in the urine upon standing. What little urine the patient passed after the first day was clear and amber colored.

Two specimens of blood were cultured on admission and intramuscular administration of chloramphenicol was started. A total of 3 gm of this antibiotic was given in the first 72 hours. A 3-inch vertical incision was made in the posterior thigh and a smaller horizontal incision was made at the gluteal crease. Both incisions were carried down to

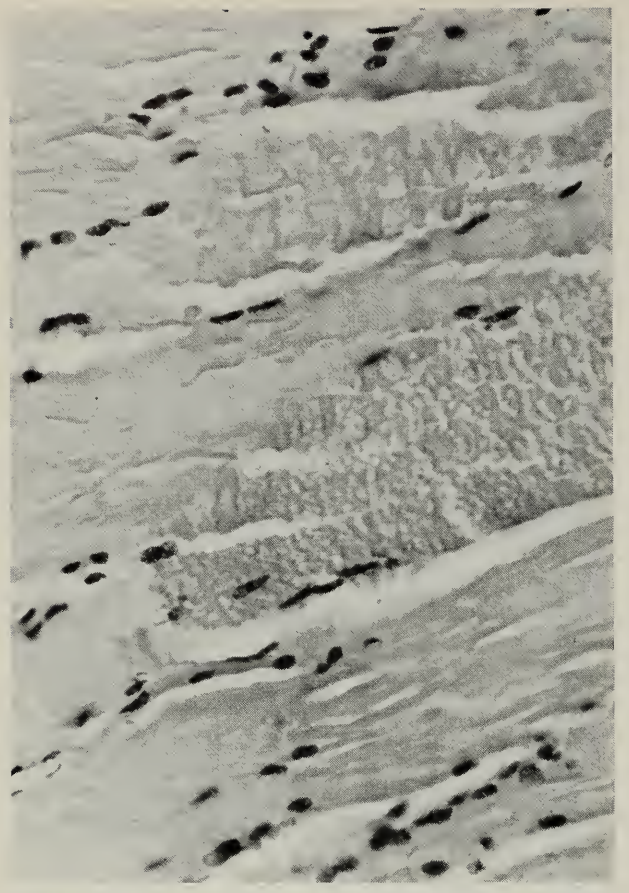


Figure 1.—Photomicrograph of muscle biopsy showing degenerating fibers adjacent to normal muscle. There is no inflammatory reaction. (Hematoxylin and eosin, ×525.)

bone but no abscess was found. The muscle appeared pale and decidedly edematous and it bulged into the incision. Biopsy specimens were excised and cultures were made of exudate taken directly from the muscle. The wound was left open and a sterile dressing applied. Immediately after the operation the skin temperature and arterial pulsations improved and became equal to those in the left leg.

On microscopic examination of the biopsy specimens peculiar granular degeneration of about one out of ten fibers, without noticeable cellular reaction, was noted (Figure 1). The cultures of muscle exudate were sterile as were both blood cultures.

Pronounced oliguria and uremia developed. Urine output fell to 20 to 30 ml per hour. An intravenous infusion of Mannitol® (a hexahydric alcohol) caused no increase in output of urine. Standard conservative measures were instituted to manage the acute renal failure. In spite of the large mass of muscle involved, serum potassium did not rise very rapidly, reaching a peak of 6.2 meg per liter on February 26 and falling to 5.1 meg per liter the next day on February 27 after the oral administration of sodium polystyrene sulfonate (Kayexalate®) and Sorbitol® (sugar solution). Serial electrocardiograms showed no deviation from the normal. However, the rest of the uremic syndrome was severe and progressive. The serum creatinine was 18.8 mg per 100 ml and the blood urea nitrogen (BUN) 144 per 100 ml on February 27.

The patient was transferred to the University of California Medical Center, San Francisco, for hemodialysis. There the clinical course was characterized by semi-coma, pronounced neuromuscular irritability, focal and generalized seizures, several bilateral dislocations of the temporal mandibular joints upon yawning, decided hyperphosphatemia and hypocalcemia and transient severe hypertension with blood pressure as high as 210/120 mm of mercury. The blood pressure was controlled by giving reserpine intramuscularly, and later this treatment was not required. A serum glutamic oxaloacetic transaminase was 93 units measured 16 hours after the first hemodialysis. Hemodialysis was carried out three times, after which renal function began to return with the expected diuretic phase of tubular regeneration reaching a peak on March 16. The blood urea nitrogen and serum creatinine returned to normal.

The patient was returned to Alta Bates Community Hospital on March 15. A lower urinary tract infection of E. coli cleared on treatment with nitrofurantoin given by mouth. Swelling of the thigh regressed and the surgical wounds healed completely. Results of additional laboratory studies on April 1 and April 3 were as follows: serum protein-bound iodine, 6 micrograms per 100 ml, serum cholesterol 248 mg per 100 ml and serum glutamic oxaloacetic transaminase 26 units. The total protein was 6.7 gm, the albumin 3.3 gm and the globulin 3.4 gm per 100 ml. The patient was discharged from the hospital on June 1, 1963.

Sciatic nerve function returned slowly and at last report was incomplete. Motor power came back first and there was progressive but incomplete return of sensation. There was still painful hypesthesia below the knee with paroxysms of pain in the posterior tibial and peroneal nerve distributions. The most tender point over the posterior tibial nerve (Tinel's sign) had moved down to midcalf. The knee jerk was still diminished and the ankle jerk absent. The patient was able to work as an accountant, drive his car and walk without assistance. There was no sign of recurrence of muscle disease by clinical examination and several measurements of the serum glutamic oxaloacetic transaminase. Little atrophy occurred. At last examination the difference between the circumferences of the thighs was 1 cm.

Bilateral gynecomastia developed during the convalescence but at last report was regressing. This

is probably an unrelated phenomenon since the patient remembered having had it in years past unilaterally and intermittently.

In July 1963 the patient was studied at the Clinical Investigation Center, U.S. Naval Hospital, Oakland, California, for possible myophosphorylase deficiency. His reaction to an ischemic exercise test was normal—normal rise in serum lactic acid and fall of serum pH in the blood returning from an arm made ischemic by a tourniquet and exercised—thus ruling out McArdle's syndrome.

Discussion

The patient had an explosive idiopathic degeneration of the large muscle mass in the right thigh, causing heavy myoglobinuria and acute renal tubular damage, oliguria and uremia. Pronounced swelling in the thigh apparently caused compression necrosis of the sciatic nerve and compromised arterial circulation until pressure was relieved by surgical incision. The diagnosis was suggested by the brown urine which was positive for blood but without red cells and occurring with no gross evidence of hemolysis in the serum. Since hemoglobin is bound to a mucoprotein, haptoglobin, when it is liberated in the serum, its renal threshold is over 100 mg per 100 ml, a level which causes the serum to appear grossly pink. Myoglobin is not bound to serum protein and is thus excreted at a much lower renal threshold, allowing urinary pigment to appear when the serum is grossly clear. The confirmatory tests were the demonstration of myoglobin in the urine by the ammonium sulfate precipitation technique and the muscle biopsy showing degeneration of muscle fibers.

Perhaps earlier use of Mannitol® could have prevented the acute renal failure. It is also thought that alkalinization of the urine minimizes myoglobinuric damage to the kidney. These measures should be tried very early if myoglobin is excreted in the urine.

The localization of the disease in the present case was unusual and the associated sciatic palsy unique. "Pseudo paralysis" has been reported in the literature but no report could be found of definite concurrent nerve palsy. The flaccidity of the involved muscles in the present case and one other case[3] would seem to contradict the recent speculation about an intrinsic defect in muscle-relaxing factor or factors.[13]

In this case, and in the majority of others, residual atrophy was slight or non-existent, suggesting a reversible process rather than a complete necrosis of muscle.

Summary

Acute idiopathic rhabdomyolysis, myoglobinuria and reversible renal failure occurred in a 39-year-old white man. He recovered after hemodialysis. He had not exercised before the onset of the disease and no other precipitating factors could be determined. A unique feature was a concurrent sciatic nerve pressure palsy.

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ADDENDUM: After the preparation of this report, increased pain in the right calf developed on January 5 and 6, 1964. On January 7, 1964, serum glutamatic oxaloacetic transaminase was 133 units. This is the first clinical or laboratory sign of recurrence of muscle disease. The urine remained grossly clear and there was no paralysis at this time. Again, there were no obvious precipitating factors.

On June 22, 1964 a biopsy specimen from the right gastrocnemius was studied for possible abnormal or fetal myoglobin by Dr. George Theil, Clinical Investigative Center, U.S. Naval Hospital, Oakland. Electrophoresis of the extracted myoglobin showed a single heme band compatible with adult myoglobin only. Further details of this study and electron microscopy study of the biopsy will be incorporated in a separate report by Dr. Theil.

REFERENCES

1. Beeson, P. B., and McDermott, W.: Cecil-Loeb Textbook of Medicine, W. B. Saunders Co., 1963, p. 1464.

2. Benoit, F. L., Theil, G. B., and Watten, R. H.: Foetal myoglobin in the urine of an adult, Nature, London, 199:387, 1963.

3. Bowden, D. H., Fraser, D., Jackson, S. H., and Walker, N. F.: Acute recurrent rhabdomyolysis (Paroxysmal myohaemoglobinuria), Medicine, 35:335, 1956.

4. Bywaters, E. G. L., and Stead, J. K.: Thrombosis of the femoral artery with myohemoglobinuria and low serum potassium concentration, Clin. Sci., 5:195, 1945.

5. Comings, D. A., and Rosenfeld, H.: Idiopathic paroxysmal myoglobinuria, Ann. Int. Med., 55:647, 1961.

6. Fahlgren, H., Hed, R., and Lundmark, C.: Myonecrosis and myoglobinuria in alcohol and barbiturate intoxication, Acta Med. Scand., 158:405, 1957.

7. Hed, R.: Myoglobinuria, A.M.A. Arch. Int. Med., 92: 825, 1953.

8. Heitzman, E. J., Patterson, J. F., and Stanley, M. M.: Myoglobinuria and hypokalemia in regional enteritis, A.M.A. Arch. Int. Med., 110:155, July, 1962.

9. Kossman, R. J., Camp, W. A., and Engle, R. L.: Idiopathic recurrent rhabdomyolysis with myoglobinuria, Amer. J. Med., 34:554, April, 1963.

10. McArdle, B.: Myopathy due to a defect in muscle glycogen breakdown, Clin. Sci., 10:13, 1951.

11. Meyer-Betz, F.: Beobachtungen an einem eigenartigen mit muskellähmungen verbundenen fall von hamoglobinurie, Deutsche Arch. Klin. Med., 101:85, 1911.

12. Page, L. B., and Culver, P. J.: A Syllabus of Laboratory Examinations in Clinical Diagnosis, Harvard Univ. Press, 1960, p. 323.

13. Scarpelli, D. G., Greider, M. H., and Frajola, W. J.: Idiopathic recurrent rhabdomyolysis, a clinical, chemical and morphological study, Amer. J. Med., 34:426, March, 1963.

14. Schmid, R., and Mahler, R.: Chronic progressive myopathy with myoglobinuria: Demonstration of glycogenolytic defect in muscle, J. Clin. Invest., 38:2044, 1959.

Extremely Resistant Hyperthyroidism

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GRAVES' DISEASE is relatively uncommon in children. Hayles and coworkers[5] reported a total of 253 cases in patients less than 15 years of age at the Mayo Clinic in the 48 years 1908-1955. The ratio of females to males was 6:1. The cause of this disease is still unknown. Sometimes a long-acting thyroid stimulator (LATS) can be found in the blood. Factors influencing resistance to therapy are not well understood. This report deals with an extremely resistant case in a young patient.

Report of a Case

An 11-year-old Chinese girl was first admitted to Presbyterian Medical Center on November 8, 1961, with complaint of loss of weight, irritability, excitability and excessive perspiration.

On examination she was hyperactive but there was no exophthalmos. The thyroid gland was slightly enlarged. The blood pressure was 140/80 mm of mercury and the pulse rate was 140. Protein-bound iodine was 9.8 micrograms per 100 ml of blood (normal 3.6-7.6). Red cell uptake of T^3 triiodothyronine was 59 per cent (normal 13-20 per cent).

Propylthiouracil, 100 mg four times a day, was prescribed and the patient was dismissed from the hospital.

At first there was considerable clinical improvement and the red cell uptake of T^3 dropped to 21 per cent (Chart 1), but soon the symptoms began to recur and the amount of propylthiouracil was gradually increased to 800 mg a day with no significant clinical improvement. The T^3 uptake remained about 30 per cent.

On March 6, 1961, the patient was readmitted to the hospital and phenobarbital, 32 mg four times a day was given for sedation. The results of a radioiodine uptake study, done while the patient was

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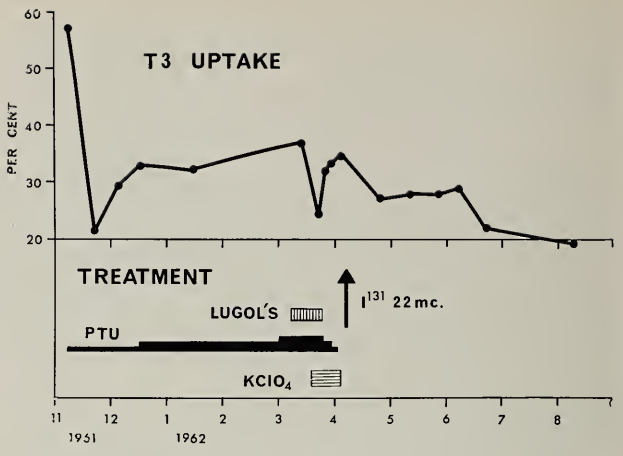


Chart 1.—Changes in the red cell uptake of triiodothyronine (T^3) during treatment. (Normal range 13 to 20 per cent.) Four months after the patient received a large dose of radioactive iodine, the result of the test was within normal range for the first time. (PTU = propylthiouracil; $KClO_4$ = potassium perchlorate.)

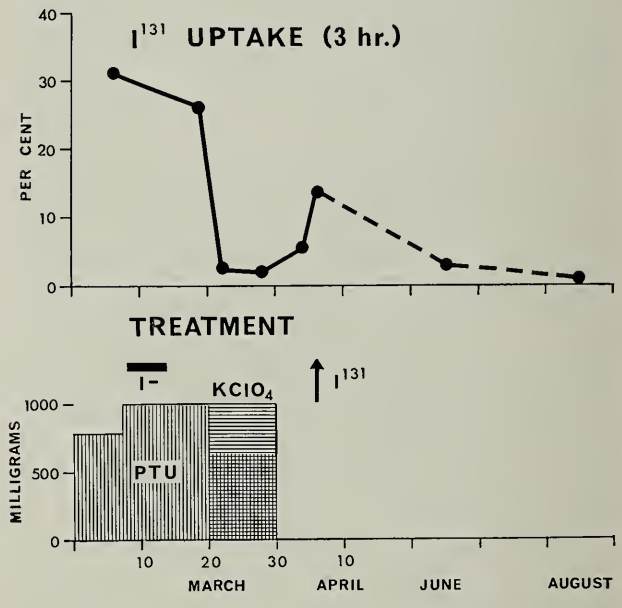


Chart 2.—Changes in the 3-hour uptake of I^{131} during treatment. (Normal range 5 to 15 per cent.) Large doses of propylthiouracil did not effectively block uptake. Perchlorate did block uptake but failed to affect the clinical hyperthyroidism. Note rapid rise in uptake after discontinuance of drugs. (I^- = iodide; $KClO_4$ = potassium perchlorate; PTU = propylthiouracil.)

taking 200 mg of propylthiouracil every six hours, was as follows: at one hour 28 per cent, three hours 31 per cent, five hours 33 per cent, 24 hours 22 per cent. The dosage of propylthiouracil was increased to 300 mg every six hours with no clinical or laboratory improvement. Lugol's solution, five drops four times a day, was given for one week, again with no improvement. Lugol's solution was discontinued and the patient was treated with potassium perchlorate, 250 mg every six hours, as well as propylthiouracil, 150 mg every six hours. Under this

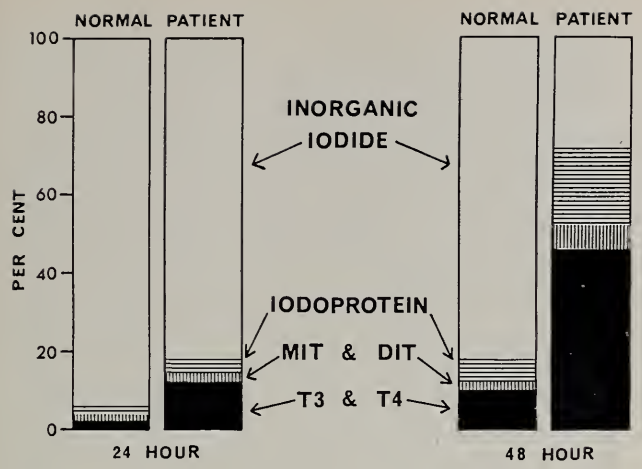


Chart 3.—Chromatographic analysis of iodinated compounds in the serum 24 and 48 hours after the therapeutic dose of I^{131} showed increased production of thyroid hormones—thyroxin (T^4) and triiodothyronine (T^3)—as compared to normal. MIT=monoiodotyrosine. DIT=diiodotyrosine.

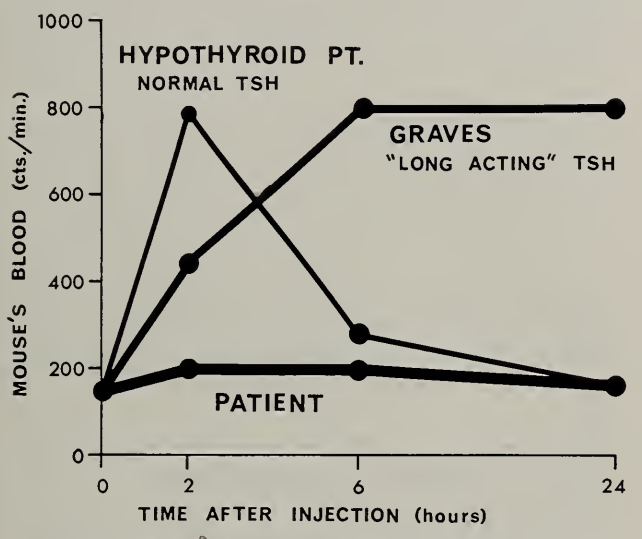


Chart 4.—Mouse assay for thyroid stimulating hormone consists of measuring release of radioiodine from the mouse's thyroid gland into his blood after intraperitoneal injection of human serum. Normal TSH (taken from a hypothyroid patient) gives a peak response at 2 hours. The serum of some patients with Graves' disease gives a prolonged effect lasting 24 hours or more. The patient's serum contained neither normal nor long-acting TSH. (TSH=thyroid stimulating hormone.)

regimen her three-hour uptake of I^{131} dropped to 2.5 per cent but over a period of ten days there was no clinical improvement and the red cell uptake of T^3 was consistently about 33 per cent. It was therefore decided that it would not be feasible to prepare this patient for surgical thyroidectomy and all antithyroid drugs were discontinued. The I^{131} uptake rose very rapidly (Chart 2) and three days later she was given a therapeutic dose of 20 millicuries of I^{131}. After this, she slowly improved but for almost three months remained clinically hyperthyroid and continued having greater than normal red cell uptake of T^3 (Chart 1). Subsequently, however, she became completely euthyroid, gained considerable weight, had red cell T^3 uptake of 17 per cent and three-hour I^{131} uptake of 6 per cent. The thyroid gland was no longer palpable.

Some special studies were done on the patient while she was in the hyperthyroid state: (a) ion exchange resin column chromatography of iodide compounds in her blood (Chart 3). Following administration of radioactive iodine she showed excessive production of thyronines (thyroxin and triiodothyronine) which is characteristic of Graves' disease.[2] (b) Bioassay for thyroid stimulating hormone and long-acting thyroid stimulator by the McKenzie mouse assay technique.[7] Despite the severe clinical course in this case, there was no detectable level of thyroid stimulating substance in the serum.

Discussion

The features of the case here reported bring into focus many of the current problems regarding our understanding of hyperthyroidism. We do not know the cause of the disease or why some patients are resistant to therapy. The author has reported on identical twins with hyperthyroidism; one of them considerably more difficult to treat than the other.[6] In the present case the disease resisted all forms of therapy: iodide, propylthiouracil, perchlorate and ultimately radioactive iodine.

Perchlorate blocks iodine uptake in the thyroid gland by competing with iodide for "trapping sites" on the thyroid cell. Hence it can be used in conjunction with the thiouracil drugs, which block the next step in thyroid hormone metabolism, namely the conversion of trapped iodide to iodine, but it cannot be used in conjunction with iodide (saturated solution of potassium iodide or Lugol's solution) because large quantities of iodide will displace perchlorate and break through the block. This material has been widely used as an antithyroid drug in England[2] but has found little favor in this country.

In general one prefers not to treat children or adolescents with radioiodine, although in fact there is no clear-cut evidence that such treatment increases the incidence of thyroid carcinoma. However, Sheline and coworkers[8] reported increased incidence of thyroid nodules several years after I^{131} treatment in a small group of children, and it is known that roentgen ray treatment to the neck region in infancy—and, to a lesser extent in adolescence—is associated with an increased incidence of thyroid carcinoma in later life.[3] For this reason we felt that in the present case it would be best to give a large obliterative dose of radioiodine so that there would be no thyroid tissue left to develop

neoplastic changes. Despite the large dose used, the patient had a significant amount of residual thyroid function long after treatment. When Adams[1] first described the abnormal long-acting thyroid stimulator (LATS) of Graves' disease, it was hoped that this substance could be incriminated as the specific cause of this disorder. Unfortunately, in most series, less than half the patients with Graves' disease have a detectable level by mouse bioassay. The source of LATS has not been determined. There is considerable evidence that it does not originate in the anterior pituitary gland.[9]

Summary

In an extremely resistant case of hyperthyroidism occurring in an 11-year-old Chinese girl, large doses of propylthiouracil and potassium perchlorate failed to control the disease and ultimately radioactive iodine was used. No significant level of thyroid stimulating hormone or long-acting thyroid stimulator could be detected in the blood of the patient.

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REFERENCES

1. Adams, D. D.: The presence of an abnormal thyroid stimulating hormone in the serum of some thyrotoxic patients, J. Clin. Endocrinol., 18:699-712, July, 1958.

2. Crooks, J., Clark, D., and Wayne, E. J.: A comparison of potassium perchlorate, methylthiouracil and carbimazole in the treatment of thyrotoxicosis, Lancet, 1:401-404, Feb. 20, 1960.

3. DeLawter, D. S., and Winship, T.: Follow-up study of adults treated with roentgen rays for thyroid disease, Cancer, 16:1028-1031, Aug., 1963.

4. Greenspan, F. S., Lowenstein, J. M., Spilker, P., and Craig, S.: Abnormal iodoprotein in nontoxic goiter, N.E.J.M., 269:830-833, Oct. 17, 1963.

5. Hayles, A. B., Kennedy, R. L., Beahrs, O. H., and Woolner, L. B.: Exophthalmic goiter in children, J. Clin. Endocrinol., 19:138-151, Jan., 1959.

6. Lowenstein, J. M.: Hyperthyroidism in identical twins —report of cases, one treated by surgery, the other by I^{131}, J.A.M.A., 176:377-378, April, 1961.

7. McKenzie, J. M.: Bioassay of thyrotropin in man, Physiol. Rev., 40:398-414, July, 1960.

8. Sheline, G. E., Lindsay, S., and Bell, H. G.: Occurrence of thyroid nodules in children following therapy with radioiodine for hyperthyroidism, J. Clin. Endocrinol., 19:127-137, Jan., 1959.

9. Werner, S. C.: The Thyroid, 2nd Ed., 1962, Harper and Row, 510-514.

Multiple Cardiac Arrest

Two Cases Salvaged by Massage and Defibrillation, One Internal, One External

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Submitted December 3, 1963.

THE FOLLOWING two cases are reported in order to illustrate the enormous change that has come about in the management of cardiac arrest in the last few years.

These two cases, which are comparable in many respects, represent catastrophic clinical events separated in time by four years. The first was managed by open chest cardiac massage and direct epicardial counter-shock defibrillation, the second by external cardiac massage and external defibrillation. In both cases the patient lived, but the second was far less traumatic to the patient and staff than the first.

Reports of Cases

CASE 1. A 58-year-old attorney was transferred to U.C.L.A. Medical Center from another hospital on January 4, 1958. Six days before, he had had a fainting episode in his home. His family physician who saw him shortly thereafter found him to have recovered, but counted a pulse of 40 beats per minute. Reasoning that he had complete heart block with Adams-Stokes attacks, the physician sent him by ambulance to the nearest hospital. During the trip the patient again lost consciousness and on arrival at the hospital appeared moribund: he was rigid and cyanotic and there was no perceptible pulse, blood pressure or respiration. Without hesita-

tion the physician injected 1 ml of epinephrine directly into the heart and the patient revived, with prompt return of pulse, blood pressure, respirations and consciousness. An electrocardiogram made soon afterward showed only occasional premature ventricular beats. A few days later the electrocardiogram appeared quite normal except for a delayed precordial transition. There were two days of low grade fever which abated when tetracycline was administered, and the patient felt well after the first day.

Examination on arrival at U.C.L.A. Hospital disclosed absent breath sounds on the left with hyperresonance, and very distant heart sounds. X-ray films of the chest confirmed the presence of left pneumothorax with approximately 40 per cent collapse of the lung. At this point it was suspected that the initial episode of syncope might have been associated with spontaneous pneumothorax and some shift of the mediastinum. The patient recalled having had pain in the left side of the chest after recovery from unconsciousness, but none before he fainted.

The lung impaired by pneumothorax re-expanded uneventfully. The electrocardiogram became entirely normal, and no arrhythmia of any kind was observed during a week in hospital. The patient was discharged with a small amount of residual air in the pleural space and returned a week later for a follow-up examination. At this time there was still a little air in the pleural space, but the patient felt perfectly well and had returned to his law practice. He was to have returned for a final visit a week later.

During the next few days he began to have momentary "sinking feelings," but because he knew he was to return to the hospital in a few days, he did not bother mentioning these feelings at the time.

On the evening of January 22, 1958, while seated at his desk writing a letter, he suddenly fell to the floor in a faint but promptly regained consciousness. There were three more brief episodes of syncope before the patient arrived at the emergency room of U.C.L.A. Hospital at 11:00 p.m.

An electrocardiogram was taken immediately (Figure 1). There were frequent premature ventricular beats apparently arising in the right ventricle. After completion of the electrocardiogram, the machine was disconnected from the wall socket in order to make room for the portable x-ray apparatus. The electrocardiogram electrodes remained connected to the patient and to the electrocardiogram machine. The chest x-ray which was taken at that point was not seen until hours later, but it showed complete re-expansion of the left lung with no evidence of pneumothorax.

The x-ray apparatus had just been removed from the room when the patient cried out, stiffened, became cyanotic and lapsed into unconsciousness. There was no pulse and no heart sounds. The electrocardiogram was immediately plugged into the wall socket, but about 30 seconds was required for

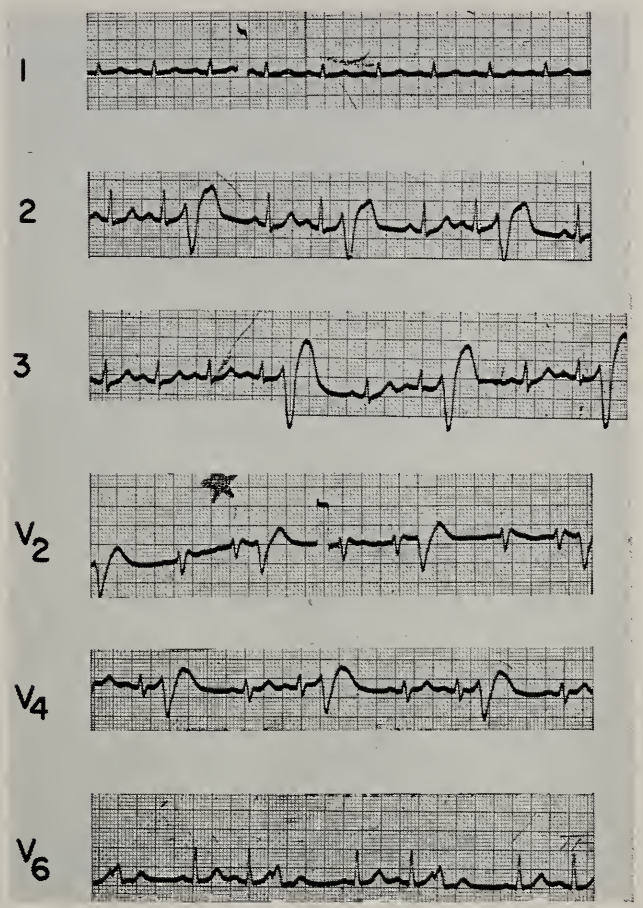


Figure 1.—Electrocardiogram recorded on Case 1 a few minutes before cardiac arrest.

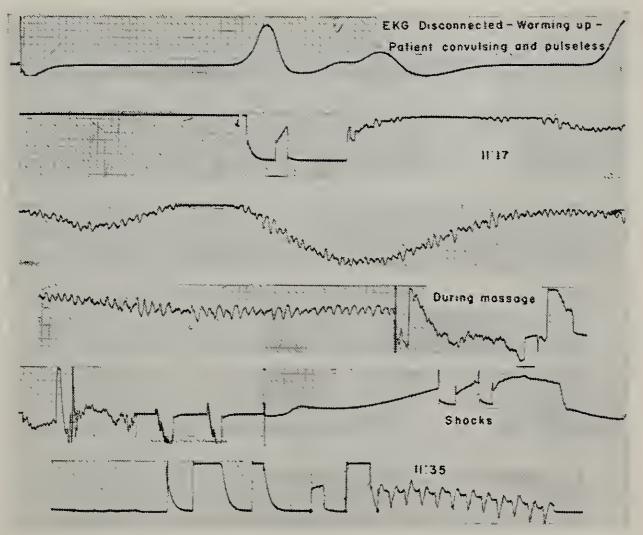


Figure 2.—Continuous strip of lead II (Case 1) recorded immediately after recognition of cardiac arrest. The machine was stopped several times during the period.

the machine to warm up. During this 30 seconds the patient's chest was thumped repeatedly and a needle was inserted into the heart twice on the theory that, if this were cardiac standstill, the mechanical stimulation might initiate systolic contraction. The first activity of the electrocardiogram stylus gave unmistakable evidence of ventricular fibrillation (Figure 2). The time was 11:17 p.m. An incision was made in the chest at 11:18 and cardiac massage was begun a few seconds later through the intact pericardium. It is estimated that circulation was in arrest for two minutes. Effective blood flow was promptly restored, and the patient regained consciousness.

An oropharyngeal airway was introduced coincident with the thoracotomy, and positive pressure respiration was begun.

At this time the patient began to struggle, apparently because of the severe incision pain and a feeling of terror induced by the smothering sensation of the mask. Shortly thereafter endotracheal intubation was carried out following intravenous injection of a single dose of 40 mg of anectine.

With the administration of oxygen and nitrous oxide, satisfactory sedation and relaxation were achieved. Intravenous administration of fluids was begun and attention was directed toward defibrillation. Paddle electrodes were applied to the pericardium and two consecutive shocks of 0.1 second duration at 110 volts were delivered to the heart. Ventricular standstill resulted, but a few seconds of manual massage led to an effective beat having the electrocardiographic characteristics of left bundle branch block.

At this time inspection of the pericardium revealed a previously unnoticed tear about 4 cm long paralleling the rib incision. Extension of the incision revealed a small arterial bleeder which proved to be a branch of the left circumflex artery. This was controlled with a single silk suture ligature. After proper inflation of the lungs was assured, the chest was closed and water-seal drainage was placed. The endotracheal tube was removed. The patient was conscious, alert and breathing on his own and blood pressure was within normal limits.

An electrocardiogram at 12:05 a.m. showed a normal sinus rhythm with a rate of 140 and frequent premature ventricular contractions. Pronestyl, 3.0 gm, and chloromycetin, 2.0 gm, were added to the intravenous fluids.

At 1:15 a.m. the patient cried out, turned ashen gray and became unconscious. The pulse and heart sounds disappeared, and the electrocardiogram disclosed ventricular fibrillation. The chest was immediately reopened through the old incision with a pair of bandage scissors.

Extrapericardial cardiac massage was again started within about one minute of onset of the fibrillation and effective blood flow was restored. Once more the patient was intubated and oxygen and nitrous oxide were administered.

Countershock defibrillation was promptly achieved, but the heart beat which followed was weak and incapable of sustaining effective blood pressure. Massage was continued in order to maintain blood flow. During this massage, there was an episode of ventricular fibrillation, again requiring countershock for conversion. Five ml of 10 per cent CaCl was injected into the left ventricular chamber with only very transient improvement in cardiac tone. One ml of normal saline solution containing 0.2 mg of norepinephrine per 100 ml was given intravenously, bringing about a pronounced increase in cardiac tone and a systemic blood pressure of 200 mm systolic.

Within a few minutes there was a recurrence of ventricular fibrillation. It was successfully converted by countershock. A slow intravenous drip of norepinephrine (1.6 mg per 1,000 ml) was then started. By this method, the blood pressure was maintained between 110 and 120 systolic.

The chest was closed for a second time. The endotracheal tube was left in place and intermittent positive pressure respiration was continued.

During this period the patient was in obvious distress. He signalled for pencil and paper and wrote, "I cannot synchronize." The automatic positive pressure was discontinued and his respirations were assisted with manual bag compression.

The electrocardiogram continued to show frequent premature ventricular contractions despite the slow intravenous infusion of pronestyl.

At 2:40 a.m. 0.4 gm of pronestyl was given intravenously. Within a few minutes there was a short burst of ventricular tachycardia at a rate of 200. Moments later ventricular fibrillation again occurred. At 2:45 the chest was opened a third time. Massage was instituted and defibrillation was accomplished by electric shock. The blood pressure was well maintained and the chest was closed after spontaneous heartbeat was established. Needle electrodes were implanted in the chest wall at opposite ends of the incision. Respiration was assisted with intermittent positive pressure and infusion of norepinephrine was continued.

At 3:50 a.m. the patient wrote a note stating he had a sinking feeling. The electrocardiogram showed a brief burst of ventricular fibrillation with spontaneous conversion.

At 3:51 a.m. quinidine gluconate, 0.24 gm, was given intramuscularly. At 3:55 a.m. sustained ventricular fibrillation began. The patient was observed to convulse and two shocks were administered via the needle electrodes. The heartbeat

returned and the patient regained consciousness. It was believed at the time that defibrillation had been accomplished by the shocks. However, review of the electrocardiogram record disclosed that spontaneous conversion had occurred four heartbeats before administration of the shocks (Figure 3).

This was the final episode of fibrillation. In subsequent tracings only two more premature ventricular contractions were recorded. At 4:00 a.m. the patient was connected to a cardio-oscilloscope which was monitored constantly for the next five days. No further ectopic cardiac activity was observed.

The norepinephrine infusion was maintained for 72 hours and then neosynephrine infusion was substituted. This was discontinued after 48 hours.

The chest tube was removed four and a half days after it was inserted. A culture was made of a small amount of purulent material in the lumen of the tube. It grew coagulase-positive staphylococcus aureus resistant to penicillin but highly sensitive to chloramphenicol, erythromycin and neomycin.

The postoperative course was surprisingly smooth. The maximum temperature recorded was 38.8°C, on the first postoperative day. It remained below 38 degrees centigrade after the fourth day. After the tenth day it stayed within a normal range. Antibiotic therapy consisting of chloramphenicol and erythromycin was continued for three weeks during the postoperative period following an initial three-day period during which penicillin and neomycin had been given. Signs of pleural fluid noted after removal of the chest tube cleared gradually without tapping. A harsh pericardial friction rub was audible from January 25 to January 30.

During the early postoperative period the electrocardiogram showed ST elevations which were attributed to postoperative pericarditis. By the time of discharge there were only minor T-wave abnormalities and quinidine effect.

The patient was discharged on the twenty-first postoperative day with a maintenance dose of quinidine.

It was necessary for him to return to the hospital for a few days in March, 1958, for skin grafting at the site of a norepinephrine slough on the left leg. Following this he remained asymptomatic and soon thereafter returned to his law practice.

He continued to take quinidine for about a year and then stopped it voluntarily. More than five years have now elapsed since the episode of repeated cardiac arrest. The patient remains well and vigorous and partakes frequently of strenuous exercise. The electrocardiogram is normal and exercise stress tests have disclosed no evidence of coronary insufficiency.

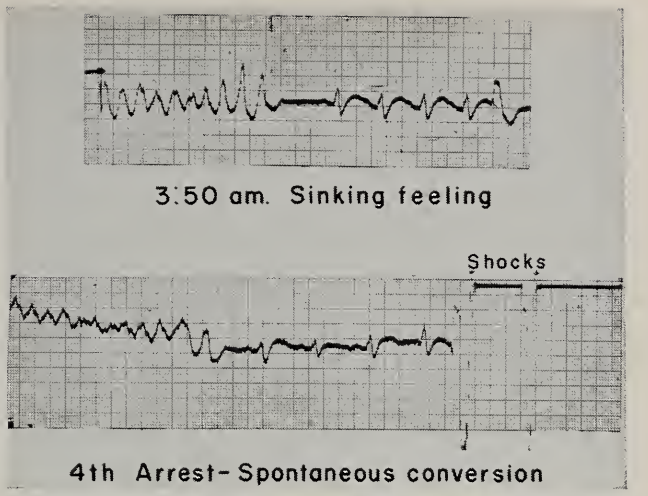


Figure 3.—Top strip was made during brief period of ventricular fibrillation with spontaneous reversion recorded when patient (Case 1) complained of a "sinking feeling." Lower strip records final episode of fibrillation believed to have converted by shocks delivered through needle electrodes. Spontaneous reversion to sinus rhythm had occurred before the shocks.

Comment: The pathogenesis of the ventricular fibrillation in this case remains unknown. The initial finding of a pneumothorax was almost certainly related to the intracardiac needle puncture and not to the subsequent fibrillation since the lung had completely re-expanded before the dramatic events of January 22. No evidence of coronary disease was discovered in the subsequent four years.

It is interesting to note that the premature ventricular beats that were observed just before the onset of ventricular fibrillation, occurred just at the peak of the T-wave of the preceding complex. This is the time of the cardiac cycle referred to by Wiggers[5] as the "vulnerable period." In experimental animals Wiggers was frequently able to precipitate ventricular fibrillation by electrical stimulation of the myocardium at just this time. One wonders whether the phenomena in the present case might not represent a clinical counterpart to Wiggers' experimental dogs.

Case 2. A 47-year-old aeronautical engineer was admitted to the U.C.L.A. Medical Center emergency room at 5 a.m. on April 24, 1962, in a state of shock. He had been quite well until three days before, when a chest cold with cough developed. On the evening of April 23 the patient had had a severe coughing paroxysm shortly before retiring. He slept comfortably until 4 a.m. when he awoke with a dull, burning substernal pain which radiated to the interscapular area of the back. When he

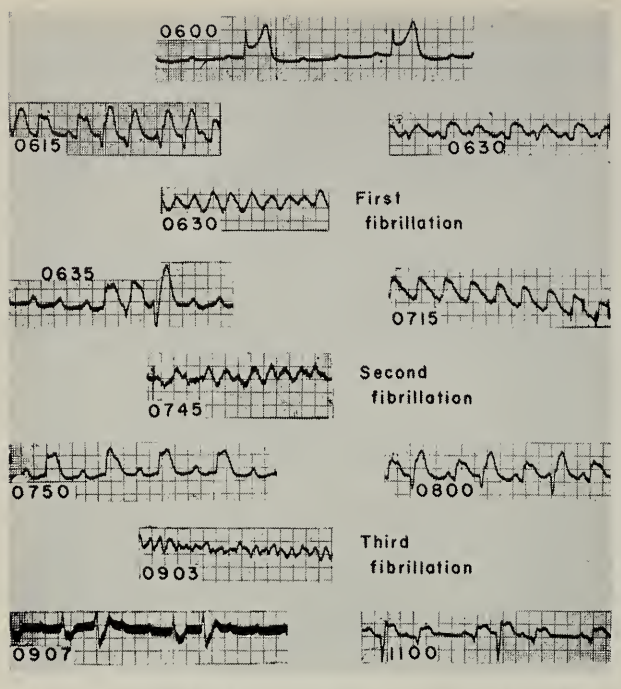


Figure 4.—Serial strips of lead II electrocardiograms recorded in Case 2 at intervals, showing three episodes of ventricular fibrillation, various arrhythmias and a strong posterior injury current. Appearance of diagnostic Q waves is noted in final strip.

began to feel faint, an ambulance was called and he was brought to the hospital.

On arrival shortly after 5 a.m. he was alert but coughing intermittently. Pulse and blood pressure were unobtainable, and no heart tones could be heard. Oxygen and meperidine were administered and an electrocardiogram was recorded which disclosed complete heart block at a ventricular rate of 22 per minute (Figure 4). The QRS complexes had the pattern of acute posterior myocardial injury. Aramine, 200 mg in 500 ml of dextrose in water, was begun by intravenous drip. In a few moments the blood pressure rose to 170/100 mm of mercury and an electrocardiogram showed frequent short bursts of ventricular tachycardia. Pronestyl, 2.5 gm, was given intravenously during the next hour but the ectopic ventricular activity was not abolished.

At 6:30 a.m. the patient became unconscious and had a convulsion. The electrocardiogram showed ventricular fibrillation. External cardiac massage by manual sternal compression[3] was begun immediately. Within a few minutes the heart was defibrillated with a single 500-volt shock administered externally through a 4-inch external defibrillator. Immediately afterward there was complete heart block with ventricular rate of 30 and ectopic beats from various foci and an atrial rate of 150. The patient was alert and the blood pressure was well maintained. At 7:15 there was superventricular tachycardia at a rate of 150 with the electrocardiographic complexes characteristic of monophasic injury. By 7:30 there was normal sinus rhythm with frequent atrial and ventricular premature beats.

At 7:45 ventricular fibrillation again occurred and the patient lost consciousness. Again a single external shock of 500 volts resulted in defibrillation and the patient revived. The heart rhythm was a two to one A-V block with a ventricular rate of 70. During the next hour sinus rhythm returned, but there was continued ectopic atrial and ventricular activity. Aramine drip maintained the blood pressure at levels in the region of 150/100 mm. At 9:30 the heart fibrillated a third time. External shocks of 500 volts did not help. After four shocks at 1,000 volts (the maximal capacity of the instrument) defibrillation was finally achieved, resulting again in complete heart block. At 9:25 normal sinus rhythm had returned, and thereafter the ectopic activity was much reduced. During the next two hours Q waves appeared in lead III and the injury potential began to lessen. Blood pressure was sustained at about 100/70 mm without artificial aid. Aramine was discontinued because of the fear that it might be contributing to the ventricular irritability.

By 11:00 a.m. the condition of the patient had stabilized sufficiently to permit moving him to the hospital ward. There was some nausea and sweating for a short period, but by afternoon he was resting comfortably and all ectopic beats had disappeared from the constantly monitored oscilloscope electrocardiogram.

A classical posterior myocardial infarction evolved. There was low grade fever for the first few days. The serum glutamic oxalacetic transaminase (SGOT) rose to a maximum of 619 units 24 hours after admission, but 12 hours later it had fallen to 185 and by the fifth day it had returned to normal.

The subsequent clinical course was entirely uneventful. Prothrombin activity was maintained at therapeutic levels with Coumadin. Quinidine, 200 mg four times a day, was given for three weeks and then discontinued. A few small areas of second degree burn over the chest at the site of the defibrillation shocks healed rapidly and the patient was discharged from the hospital on the twenty-fifth day. Subsequent convalescence and ambulation progressed without incident and the patient returned to work.

Comment: This patient's cardiac arrests were clearly related to posterior myocardial infarction. A number of episodes of arrhythmia occurred in the first few hours after the attack, including both atrial and ventricular ectopic activity as well as conduction block. The very sharp rise in the SGOT level to a peak of 619 units suggested a large area of necrosis and an exceedingly poor prognosis.[2] How-

ever, the benign course of recovery and the patient's restoration to full activity indicate that the transaminase level might have been spuriously high. It is possible that the generalized spasmotic skeletal muscle contractions induced by the multiple electric shocks liberated considerable transaminase of skeletal muscle origin into the circulation. This suggestion is supported by the observations of Fowler,[1] who found sharp rises of numerous enzyme levels in the serum of untrained subjects following vigorous muscular exercise.

Discussion

The two cases reported here dramatically illustrate the remarkable advance that has been made in just four years in the management of cardiac arrest. In the several months following the events related in Case 1, there were three or four unsuccessful attempts made to resuscitate patients with cardiac arrest by the thoracotomy method in U.C.L.A. Hospital. This experience stimulated rather long discussions in an attempt to formulate a policy directed toward defining who should attempt such procedures, where they might be attempted, in what sort of patients, and in what circumstances.

No clearly defined policy could be arrived at except that emergency thoracotomy should not be carried out if the patient obviously had an advanced disease likely to be fatal anyhow. Emergency thoracotomy trays were placed in numerous strategic hospital areas and a number of internal defibrillation machines were purchased. The lives of at least two or three patients were saved over the next two years by emergency thoracotomy, but the unsuccessful far outnumbered the successful attempts.

Fortunately the burden of making the decision to open the chest has now been lifted from the staff. Case 2 is a dramatic illustration of salvage by the new technique which has proven its value in our experience as well as in that of others.[4] There now appears to be no reason not to try resuscitation in any circumstances if there appears to be any chance of success.

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REFERENCES

1. Fowler, W. M., Chowdbury, S. R., Pearson, C. M., Gardner, G., and Bratton, R.: Changes in serum enzyme levels after exercise in trained and untrained subjects, J. Applied Physiol., 17:943, 1962.

2. Kattus, A. A., Watanabe, R., and Semenson, C.: Diagnostic and prognostic significance of serum transaminase levels in coronary occlusive disease, Circulation, 15:502, 1957.

3. Kouwenhoven, W. B., Jude, J. R., and Knickerbocker, A. A.: Closed-chest cardiac massage, J.A.M.A., 173:1064, 1960.

4. Rivkin, L. M., and Gardner, R. E.: Cardiac resuscitation through the intact chest, Calif. Med., 96:75, 1962.

5. Wiggers, C. J.: The mechanism and nature of ventricular fibrillation, Am. Heart J., 20:399, 1940.



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EDITORIAL

Workmen's Compensation

A NEW ERA of responsibility and trust for the medical profession in the administration of the workmen's compensation laws of the state has again been proposed by the California Medical Association.

The proposal has come in two appearances of C.M.A. representatives before the Governor's "blue ribbon" Workmen's Compensation Study Commission. This body has been named to take a close look at the entire structure of the Industrial Accident Commission and its processing of the laws relating to workmen injured in the course of their employment.

What the C.M.A. has proposed is that a medical administrative division be set up within the Industrial Accident Commission, to have as its responsibilities the supervision of all aspects of the compensation law relating to medical care, rehabilitative services, determination of disability, establishment of fees to be paid to physicians and the determination or certification of medical facts in litigated cases.

This division would be headed by a medical administrator, who would have access to a broadly-based medical advisory committee. Findings of medical fact by this division would be binding upon all referees and the members of the Industrial Accident Commission in the absence of substantial evidence to the contrary.

At this time we have no way of knowing how the "blue ribbon" commission will handle this proposal but we are confident that its acceptance and implementation would be extremely cheerful news to the vast majority of physicians in California.

The state's Industrial Accident Commission was established more than 50 years ago following passage of laws which held that society as a whole is responsible for disabling injuries suffered by any employed person. These laws placed upon the employer the immediate responsibility for seeing that the injured workman received all needed medical and hospital care and provided that the injured workman should be paid damages, in lieu of wages, during his period of disability.

When these laws were first enacted the position of the medical profession was that this was a matter of politics, not medicine, and that physicians should keep hands off. This position left the way wide open for the adoption of a schedule of minimum fees to be paid physicians for their treatment of industrial injury cases. These fees, admittedly low, were stated to be based on the fees a physician might expect to receive in his private practice from a patient then earning an average of $1,000 a year. Please remember, this was in 1912.

In 1921 it was calculated that the average earnings of those workmen covered by the law were $1,250 a year and the medical minimum fee schedule was increased by 25 per cent. Since that time no attention has been paid to the average earnings of the covered employees.

No change occurred in medical fees in compensation cases until the years of World War II, when the insurance carriers voluntarily added a 15 per cent "surcharge" to the fees they paid. What percentage of this added amount represented bidding in an extremely tight medical market, with one-third of all practicing physicians having gone to war, and what percentage to guilt feelings by the insurance carriers can only be a guess. Nevertheless, the "surcharge" remained in effect until the C.M.A. started to campaign for increased medical fees in the 40's and waited more than four years before any progress was recorded. Since then some changes have been made in the state laws and changes in the medical

fee schedule can now be made on the basis of an application, public hearings and a decision by the Industrial Accident Commission. The C.M.A. has availed itself of this machinery on several occasions and will doubtless continue to do so.

Meanwhile, in the cross-currents of fee controversies between the medical profession and the insurance carriers, sight was practically lost of the humane side of the compensation laws, namely, the restoration of injured workmen to the optimum function compatible with their injuries.

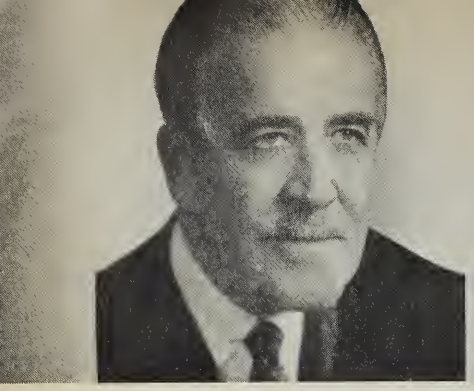
This phase of dealing with the injured has now started to reappear in discussions of workmen's compensation laws and their application and administration. We now hear of retraining programs, where the employee who has lost full function in some part of his body may be trained to use a skill requiring other and fully functioning muscles. We also hear of rehabilitation as a responsibility of the employer and of society.

Arguments for rehabilitative services to the injured workman necessarily revolve around the concept that an injury resulting in partial disability need not preclude the injured man from any form of gainful employment in the future. The man who has lost some fingers may be trained to use his other hand, or his feet, or his head, in another line of work. Or he may be able to retrain the remaining portion of his hand into a useful and usable tool in another line of endeavor.

This concept lies behind the C.M.A.'s proposal that the medical administrative division should have charge of rehabilitative measures, that physicians should control the medical care and rehabilitation of the injured workman. The members of the Industrial Accident Commission are appointed by the governor and their appointments are made in the interests of politics. It is notable that over the 52 years that workmen's compensation laws have been on the books there has not yet been a physician as a member of the commission. Meanwhile, all cases coming before this body are based on injuries which require medical care; the physician has become the keystone of the entire system and his judgment and skill will be even more necessary if a program of rehabilitation is added to the compensation program.

It is to be hoped that the proposals of the California Medical Association for medical control over the medical aspects of the Industrial Accident Commission's activities will fall upon ears that hear, minds that comprehend and hearts that act for the well-being of our injured fellow men.





The President's Page

CALIFORNIA NEEDS MORE TRAINED NURSES

National Community Health Week, scheduled for October 18 to 24, will focus public attention this month on the development and growth of modern community hospitals. At the same time, it will draw the public eye to a corresponding increase in the need for expanded medical care at the community level.

One of the most valuable members of the medical team is the trained nurse—the "R.N." Today, the R.N., both male and female, is in short supply—both in California and throughout the United States. Clifton H. Linville, president of the California Hospital Association, offers one important reason why:

Of the state's 56,500 registered nurses, over 21,000 or 38 per cent, are out of medicine today. That's far above the national average for retired R.N.s of 29.5 per cent, which is serious enough.

The number of nurses employed in California hospitals is inadequate to provide the around-the-clock care required for the state's 18,000,000 people at the present time—and our population is growing at the rate of 1,500 persons each day.

According to a study recently released by the State Department of Employment, the shortage of registered nurses will become even more critical in the next few years.

In an effort to reverse this trend, the CHA has been waging a campaign to persuade inactive registered nurses to return to their profession. The California Nurses Association and the California League of Nurses have been of valuable help in the campaign. They have developed excellent and practical "refresher" course outlines for community-based training programs aimed at bringing ex-R.N.s up to date on current medical practices.

Highly successful retraining programs have been conducted at San Jose Hospital in San Jose for the past several years. Similar programs have recently been started in a number of Bay Area and Southern California hospitals.

The State Department of Employment, which administers Manpower Development Training Act funds, now is attempting to set up continuing programs of this type in hospitals throughout California. The Department intends to place as many retrained R.N.s as possible, wherever they are needed.

I believe this is a most commendable program, deserving our full support. I hope everyone concerned with providing the best in medical care will join forces to ensure its success. Physicians can help by urging former R.N.s with whom they are acquainted to contact their local hospitals about the possibility of taking a refresher course and returning to work.

We're going to need to encourage many more young women to go into nurses' training. I believe it would be a good idea for the American Medical Association, the California Medical Association and the county societies to develop and expand loan funds for such training, similar to those we have for young men studying to be physicians.

I would like to see an expanded visiting nurses' program to provide increased home care. We have a shortage there, too.

I recall how much has been accomplished when the California Nurses Association and CMA have worked together on mutual problems. We fought together against King-Anderson legislation. We took effective common stands on such diverse problems as hypnosis and medicine, tuberculosis tests and blood transfusions. I look forward to equally effective cooperation in the future.

With such cooperation among all medical groups, I am confident that we can meet the challenges spawned by our state's accelerating growth.

James C. Doyle

California Medical Association

NOTICES AND REPORTS

Policies of the Department of Mental Hygiene

JAMES V. LOWRY, M.D.
Sacramento

THE OBJECTIVE of this brief presentation is to state some of the policies of the Department of Mental Hygiene and to describe some of the programs that relate to those policies.

One of these policies is that the basic responsibility for meeting treatment needs of a person with a mental disorder rests with the individual and his family through private resources. It is only when these resources of the individual are incapable of meeting the cost of his needs that there exists any public responsibility for his care.

A second policy is that psychiatric services will be provided insofar as possible by private rather than public sources and that the Department of Mental Hygiene should encourage in every way the increase in prepaid medical insurance plans in order that they would include psychiatric disabilities. I have activated a new position within the Department with the objective of increasing the number of health insurance plans that will include psychiatric disorders in order that there will be less need for public services.

The third policy is that there will be full and free cooperation between public and private professional persons and agencies.

These are three operating policies which I intend to utilize. In order to implement them I am establishing a medical advisory committee. I am appointing two members each from the Northern, Southern and Central Psychiatric Societies and two members from the California Medical Association. I will invite, as ex-officio members, the medical advisers of the California Council for Retarded Children and the California Association for Mental Health. From these ten physicians I expect to get good advice on programs of the Department which are planned, which should be decreased, or which should be strengthened. This group will provide advice on proposals for new legislation that will affect the

This statement was taken from remarks of Dr. Lowry before the Council of the California Medical Association at its meeting August 8, 1964. Dr. Lowry became Director of the California State Department of Mental Hygiene in April, 1964.

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Department; and I will keep this group advised of progress in legislation.

You might be interested in knowing how California compares with some of the other states with regard to the three policies that I have given to you. California has about 15 per cent of its beds for mental disorders in private psychiatric facilities, as compared with the average of 2½ per cent for the nation as a whole. California, then, has a good start in provision of care for patients with mental disorders through private facilities. There are, in all, about 10,000 (of California's total of 64,000 beds for psychiatric patients) in 450 specialized private facilities. This is a development which is encouraged by the Department. The Bureau of Private Institutions of the Department of Mental Hygiene is concerned with licensing. A large part of its responsibility is encouragement and consultation services directed toward establishment of additional private facilities for the care of patients with mental disorders.

You might like to compare California with other states with regard to the average daily population in public mental hospitals per 100,000 of state population. California is 37th in the United States. It has in its hospitals fewer patients per 100,000 population than 36 other states. This is a good record. If you want to conjecture on the factors involved, it may be that Californians just do not get mental disorders and do not need to be hospitalized. However, this may not be the entire story. It may have a relationship to the provision of psychiatric services in the local communities. This may reduce the need for placement of patients in public mental hospitals. It also has to do with the shortened length of stay in our public mental hospitals — a remarkable achievement of the past few years — so patients leave the hospitals sooner. The hospital population is decreasing steadily even though the number of admissions is increasing. This is a rather remarkable accomplishment because the California state mental hospitals actually rank 23rd in the number of full-time staff personnel per 100 hospitalized patients. In other words, the progress that has been made is not because California hospitals compare favorably in their staffing with other state hospitals, but because they are able to produce results in spite of the paucity of the staffing.

I have enumerated some of the policies and commented briefly on how California compares with some of the other states; I would like to tell you some of the things that have happened in the Department. I retired from my position in Washington, D.C., on the last day of March, 1964, and began work in California the second day of April. On the third day of April the Department was reorganized. This may sound like rather precipitous action, but actually I was here for a week in January, a week in February, and another week in March. It was during my time here and while flying back and forth across the country that I developed my ideas about organization of the department. I have grouped all the activities into four divisions: One of these is a new division on resources and planning. This division includes research. Over a million dollars of state funds and two million dollars of federal funds are invested annually in the research program. It includes professional training activities. The California mental hospital system has more residents in psychiatry than any other single training activity in the United States. It is a very large undertaking. The division includes the new planning bureau. I am looking for a definitive operating plan for the Department which will extend over five years and be reviewed and revised every year. It will specifically state what we want to accomplish each year. I am seeking staff for this new division of resources and planning. It is very, very difficult to recruit a staff of the quality that I want because salaries are not competitive with other states.

One type of mental disorder that has not been given enough attention in the past is the problem of mental retardation. There are 13,000 patients in state hospitals with mental retardation. At least 4,000 of these patients could be cared for in residential facilities rather than in hospitals. There are inadequate facilities and funds to place these retarded patients in residential facilities. They continue to remain in the hospitals. If we could move out these patients — 4,000 of them — our hospital population of retardates would be reduced to about 8,000 and the hospitals could meet the standards set by the American Association on Mental Deficiency. The admission of patients who do not require hospital care should be terminated and residential care should be available. It will require considerable development of private facilities so patients can be discharged from the hospitals. It is my intention to increase the staff that deals with mental retardation. There is only one physician in the Department headquarters who devotes full-time to mental retardation —*one physician.* To strengthen the staff, I hope to add a pediatrician, an educator and other staff members so that adequate attention can be given to this large group of patients.

I am certain that progress in providing mental health services is dependent upon growth and development of local services, both private and public. A key factor will be increased health insurance that includes coverage for mental disorders. The interest and support of organized medicine is crucial to these developments, and I solicit your help.

Your time and attention are appreciated, and I thank you, Mr. Chairman, for your kind invitation to speak. It would be an appreciated privilege for me to attend future Council meetings.

Council Meeting Minutes

Tentative Draft: Minutes of the 503rd Meeting of the Council, San Francisco, Hilton Inn, August 8, 1964.

The meeting was called to order by Chairman Anderson in the Hilton Inn, San Francisco International Airport, on Saturday, August 8, 1964, at 9:30 a.m.

Roll Call

Present were President Doyle, President-Elect Teall, Speaker Quinn, Vice-Speaker Telford, Secretary Hosmer, Editor Dwight L. Wilbur and Councilors MacLaggan, Wilson, Todd, Gooel, Taw, Bullock, O'Connor, Ham, Rogers, Richard S. Wilbur, Miller, Watts, Fenlon, Kay, Kaiser, Anderson, Dozier, Grunigen, Cosentino and Sherman. Absent for cause, Councilors Maguire, Murray and Shaw.

A quorum present and acting.

Present by invitation were Messrs. Hunton, Thomas, Clancy, Collins, Marvin, Whelan, Klutch, Clark, Edwards, Bowman, James, Goldman, Moreillon and Doctor Miller of C.M.A. staff; Mr. Howard Hassard, legal counsel; Messrs. Read, Putnam and Brown of the Public Health League; county executives Rideout of Butte-Glenn, Addington of Forty First, Baker of Los Angeles, Colvin of Monterey, Bannister of Orange, Nute of San Diego, Wood of San Mateo, Donovan and Pearce of Santa Clara, York of Sonoma and Bruce of Tulare; Mr. John Pompelli of the American Medical Association; Mr. Robert Garrick, consultant; Mr. Clifton Linville of California Hospital Association; Doctor Malcolm Merrill, state director of public health; Doctor James V. Lowry, state director of mental hygiene; Doctor Lester McDonald and Mrs. Eunice Evans of state department of social welfare; Doctors T. Eric Reynolds and Paul Hoagland and Messrs. Paolini, Potloff, Nyron and Heller of California Physicians' Service; Doctors Robert Purvis, John W. Cline, Claude Gates, Melvin Sommer and Albert Long, Mrs. Edward Babcock and Miss Bernice Hemphill, representing blood banks; Doctors Stuart Knox, Homer Pheasant, Warren Bostick, Dan O. Kilroy, Sanford Feldman and others.

1. *Minutes for Approval*

Minutes of the 502nd Council meeting, held June 13, 1964, were presented and one additional item added: Item No. 3—Subsection (b) as drafted to become subsection (c) and new subsection (b) inserted, to read:

(b) The chairman requested that the Council approve a proposal to establish at the time of each Annual Session several temporary review committees composed of Council and staff members to study the decisions of the House of Delegates and to report to the Council with recommendations for Council action.

ACTION: Referred to Committee on Committees.

ACTION: Minutes as drafted and with above addition, approved.

2. *Membership*

(a) A report of membership as of August 5, 1964, was presented and ordered filed.

(b) On motion duly made and seconded, 190 delinquent members, dues now paid, were voted reinstatement.

(c) On motion duly made and seconded in each instance, ten (10) applicants were voted Associate Membership. These were: Olgard Dabbert, Stewart Bernard Gross, Kenneth R. Nelson, Helen M. Wallace, E. Anne Watkins, Miles Lorin Weber, Alameda-Contra Costa; Arnold Lloyd Knepfer, Marin County; Donald N. ReVille, Phyllis B. Thurstone, San Mateo County; Edward C. Lawless, Ventura County.

(d) On motion duly made and seconded in each instance, four members were voted Retired Membership. These were: Grace E. P. Comer, Forty First; Milton Herbert Damron, Mabel Geddes, Orange County; Benjamin H. Page, San Mateo County.

(e) On motion duly made and seconded, 13 members were voted reduction in dues for reasons of illness or postgraduate studies.

3. *Audio-Digest Foundation*

It was proposed that Audio-Digest Foundation be requested to arrange its meeting dates so that its annual meeting with the Council might be held in January of each year, rather than during the C.M.A. Annual Session.

ACTION: Voted to make such request of Audio-Digest Foundation.

4. *Report of the President*

President Doyle reported on his attendance at a postgraduate institute sponsored by the Sacramento County Medical Society, a luncheon given for physician delegates to the Republican national convention in San Francisco and an institute on mental health sponsored by the California Hospital Association.

5. *Committee for Emergency Action*

Doctor Doyle, chairman, reported on meetings held with representatives of the California Veterin-

ary Medical Association and with the board of trustees of the California Hospital Association.

Mr. Hassard reported on a meeting with the officers of the Forty First Medical Society, which has now released 127 of its members for affiliation with component societies in five areas and which expects early in 1965 to release many more of its members. The society is concerned about its members in some areas who have not made application to the component society of their own residence for transfer of membership.

Doctor Doyle reported on letters sent to the appropriate state officials relative to action taken by the House of Delegates on Resolution 33-64 and Resolution 80-64. He also read a telegram sent over his signature to all component societies urging their action in securing messages to the Senate Finance Committee relative to deleting a House of Representatives-approved measure which would include physicians under Social Security.

Doctor Anderson reported on a meeting of the Emergency Action Committee with members of the House of Delegates ad hoc committee on state fees and outlined the principles on which the Association would support Senate Bill 374. These principles call for the payment of the usual fees charged by physicians, so long as these are customary in the geographical or socio-economic area, and oppose the establishment of statewide minimum or maximum fees. Failing this, it would be urged that the state increase its budgetary provisions to permit at least the payment of such fees as other large purchasers of medical services find broadly acceptable to the medical profession.

ACTION: Principles voted approval.

6. *Committee on Committees*

Doctor Teall presented several proposed appointments, which were approved. List of these appointments is attached and made a part of these minutes.

Doctor Teall also reported approval of Council ad hoc screening committees for House of Delegates actions. Council chairman to appoint the membership.

ACTION: Approved by Council.

7. *A.M.A. Delegation*

Doctor Rogers reported that the American Medical Association had adopted a policy of conferring with state associations on committee and council appointments and presented a list of California members now serving, all of whom were approved for continuing service or reappointment. He also presented a list of committee or council vacancies, on some of which California members were named for nomination to the A.M.A. This list was also approved for submittal.

The Council received with thanks a report of the activities of the California delegation to the last A.M.A. meeting.

8. *Report of President-Elect*

President-elect Teall reported on his attendance at meetings of the Medical Advisory Committee to Social Welfare, the Association of Foundations and the Administrative Board of the State Employees' Retirement System, where Doctor Malcolm Watts had headed a committee on medical care and issued a report which Doctor Teall praised highly. Copies of this report have been ordered for distribution to officers and Councilors.

9. *State Department of Mental Hygiene*

Doctor Stuart Knox introduced to the Council Doctor James V. Lowry, who became director of the Department of Mental Hygiene on April 1, 1964. Doctor Lowry outlined some of the basic policies of the department. (For a full report of Doctor Lowry, see page 299.)

10. *State Department of Public Health*

Doctor Malcolm Merrill, state director of public health, welcomed Doctor Lowry to California and reported on joint planning between these two state departments, especially in the expanded Hospital Advisory Board, which now includes four representatives of mental health in its 12-man membership.

11. *State Department of Social Welfare*

Mrs. Eunice Evans reported that the department has a budget problem in that $8,000,000 was cut from the departmental budget by the 1964 Legislature without directions for the area to be reduced or without any change in eligibility standards. The department seeks to maintain essential services and is asking the cooperation of medical organizations with local welfare offices in reducing drug and medical care costs where possible without injury to the patient.

Mrs. Evans and Doctor Anderson also reported that Doctor Llewellyn Wilson has been honored by appointment to membership on the Medical Services Committee of the County Welfare Directors Association and to the Medical Care Advisory Committee to the State Department of Social Welfare.

Doctor Sherman reported that the department's budget now allows $13.69 a month for medical care services, compared with $15.00 possible under federal appropriations. He urged voluntary reduction of costs where possible and cited one drug item which is currently causing great expense and is replaceable by less costly preparations.

ACTION: Voted to request Legislative Committee, together with other appropriate committees to study

the implications behind the closed-end budget of the Department of Social Welfare and to report back to the Council with recommendations for appropriate action.

Doctor Sherman further reported on the high incidence of mental retardation and scarcity or lack of prenatal care and hospitalization in families receiving A.N.C. assistance, subjects under consideration by the Medical Care Advisory Committee.

12. *California College of Medicine*

Doctor Warren Bostick, dean, reported on the progress of the college, the retention of two new department heads and the general progress of the school.

13. *Bureau on Communications*

Doctor Bostick gave a progress report for the bureau and reported that Doctor Stuart Knox has presented a proposal for using closed-circuit television in promoting quality medical care. Consultation would be provided to physicians in outlying areas where difficult cases were encountered. The Bureau suggested that the Scientific Board should study this proposal for its scientific value prior to bureau action on dissemination.

ACTION: Voted to refer Doctor Knox's proposal to the Scientific Board for study and evaluation.

Doctor Bostick also commented on the cooperation provided by the California Hospital Association, particularly in its interest in communications with hospital administrations and staffs.

14. *California Hospital Association*

Mr. Clifton Linville, president of the California Hospital Association, reported warmly on the attendance of Association officers at hospital programs, praised the Public Health League of California for its effectiveness in the state Legislature and reported on the desire of hospital officials to work with the Association and its Bureau on Communications on improved liaison with hospital administrators and staff. Doctor Anderson urged additional use of CALIFORNIA MEDICINE in effecting improved liaison.

15. *Medical Executives Conference*

Mr. Everett Bannister, chairman, reported on the August 7 meeting of the Medical Executives Conference and presented the criteria adopted by the conference for membership. These provide that membership is open to any full or part-time executive secretary of a component society, that one representative per society be recognized for C.M.A. travel support and that one vote per society be allowed.

ACTION: Approval voted for these criteria.

ACTION: Membership in conference voted for Mrs. Lora Bruce, Tulare County Medical Society, and Mr. Al Whitehall, Stanislaus County Medical Society.

16. *Blood Service Insurance*

Doctor Teall recited the history of an application filed with the California state insurance commissioner for a permit to sell in California blood insurance policies through existing blood banks. The original application, filed in November, 1961, was denied but at the urging of the applicants was re-opened and a hearing held on July 10, 1964, recessed until August 19, 1964. Some California blood banks have raised the question as to the Association's taking a stand against the issuance of this permit as not being in the public interest.

Councilor Kay, as chairman of the Commission on Community Health Services, reported that the commission had not had an opportunity to meet on this question and had asked its Committee on Blood Banks to bring the question direct to the Council. Doctor Robert O. Purvis, committee chairman, reported that telephone conferences with available committee members had brought forth the opinion that this was an insurance matter on which the Association should not take a stand favoring or opposing.

Doctors Samuel R. Sherman, Malcolm Watts, John W. Cline and Mrs. Bernice Hemphill urged opposition to the issuance of an insurance permit. Doctor Harold Kay voiced approval of the contract if the terms of replacement of blood were left in the hands of the blood banks and Doctor Osman Hull suggested the matter be re-referred to the Committee on Blood Banks for a review in depth of both sides of the question.

ACTION: Opposition to proposed insurance certificate voted, this vote to be stated to the insurance commissioner's hearing. It was agreed that this vote related only to the requested insurance permit and did not affect any other blood provision contracts.

17. *Committee on Legislation*

Doctor Dan O. Kilroy, committee chairman, reported that Doctor Leroy Weekes of Los Angeles had been appointed a member of the Board of Medical Examiners and that Doctor George Johnson, a board member who is taking a sabbatical leave, is required by state regulations to resign his post. The Governor has accepted this resignation and signified his intention to make an appointment on an interim basis and to return Doctor Johnson as a board member on his return to this country.

Doctor Kilroy also discussed possible legislation which may come before the state Legislature in 1965, especially in regard to hospital staff limitations and phenylketonuria testing. He also reported an interim committee hearing to be held in Los Angeles on the social welfare programs and asked authority to have doctors Samuel R. Sherman and James C. Mac-

Laggan as witnesses to discuss the C.M.A. thinking on the medical care plans under social welfare.

ACTION: Doctors Sherman and MacLaggan authorized to represent the C.M.A. at this hearing.

Doctor Kilroy further suggested that Doctor Stuart Knox appear as a witness on hypnotism before an interim committee and reported that another committee would meet September 11 on the question of out-of-state laboratories. Discussion was held on the position of C.M.A. on out-of-state laboratories.

ACTION: Question of out-of-state laboratories voted referred to Commission on Community Health Services for further study and report.

18. *Bureau of Research and Planning*

Doctor Sherman gave a progress report on the Bureau of Research and Planning, showing that research was under way on the question of courtesy services provided by psychiatrists, on state fee schedules and on the physician fee index. A report has already been distributed on a study of industrial accident medical care.

19. *Report of the Speaker*

Speaker Quinn reported that the ad hoc Committee on State Fee Schedules had held one meeting and had scheduled an additional seven meetings. Doctor Quinn requested an appropriation of $5,000 to cover the cost of the committee's activities; this request was deferred for the report of the Finance Committee.

20. *Finance Committee*

Doctor Miller, acting chairman of the Finance Committee, reported on the request of the ad hoc Committee on State Fee Schedules and moved that an initial appropriation of $2,500 be authorized, with the understanding that the committee could request further funds in the event of need.

ACTION: Voted appropriation of $2,500 for ad hoc Committee on State Fee Schedules.

Doctor Miller further reported on the per diem and honorarium allowances for members of the Committee for Emergency Action. The committee recommended that the usual $35 per diem be allowed these representatives for all days spent on C.M.A. business for reimbursement for expenses and that an honorarium of $100 a day be allowed for those week-days spent out of their offices on C.M.A. business.

ACTION: Voted per diem and honorarium allowances as proposed.

For Delegates and Alternates to the A.M.A., the committee recommended that all Delegates and Alternates receive a standard $35 per diem to cover all usual maintenance expenses. Discussion was held on the allowance of an honorarium to C.M.A. officers who simultaneously serve on the A.M.A. delegation, on the same basis as outlined above.

ACTION: Voted to allow $100 daily honorarium for week-days for C.M.A. president, president-elect, speaker and council chairman for attendance at A.M.A. meetings where they serve as elected Delegates or Alternates or attend at the request of the Council.

21. CALIFORNIA MEDICINE

In behalf of the Scientific Board, Doctor Wilbur presented the names of Doctors Edgar Wayburn and David A. Rytand, internal medicine, and Alexander R. Margulis, radiology, for appointment as members of the Editorial Board of CALIFORNIA MEDICINE.

ACTION: Appointments voted as presented.

22. *Medical Staff Review Committee*

Doctor MacLaggan, chairman, reported that hospitals in Orange and Santa Barbara Counties had been reviewed and that about 25 per cent of all hospitals in the state have now been subjected to review. He also introduced Mr. Mike Goldman, who has been employed to coordinate the inspection program.

Doctor MacLaggan also reported that he had testified before a legislative interim committee at a hearing of Assembly Bill 2031 that the California Medical Association would insert into the Guiding Principles for Physician-Hospital Relationships, a recommendation that medical staff committees provide a hearing and appeal for those staff applicants whose privileges were denied, curtailed or limited by arbitrary or capricious rulings. He proposed that this insertion be made.

ACTION: Appeals provisions voted for insertion into Guiding Principles.

23. *Commission on Public Agencies*

Doctor MacLaggan, chairman, presented a resolution approved by the commission and asked Council approval, asking that the State of California and its Department of Public Health recognize the professional status of the public health veterinarian and that such veterinarians be employed on the same basis as allied medical scientists with comparable training.

ACTION: Resolution approved for forwarding to the State Department of Public Health and the State Personnel Board.

Doctor MacLaggan presented a report of the commission, covering the minutes of the commission meeting of July 2, 1964. One item in these minutes,

relating to "Measles Immunization under the A.N.C. Program" was voted for referral to the Commission on Medical Services and the Committee on Government Medical Care Programs.

ACTION: Report received and item XVII referred as above; in item VIII, the word "planning" is substituted for the word "control."

24. *Ad Hoc Committee on Kerr-Mills*

Doctor MacLaggan, chairman, presented a proposed statement of policy adopted by the ad hoc Committee for transmittal to the Council and the Committee on Legislation. An amendment to item No. 7 proposed that the following words be added at the end: "and that they be no less than the fees paid by other state agencies for the same or similar services."

ACTION: Amendment voted as proposed.

ACTION: Voted to transmit ad hoc Committee's statement as amended to Legislative Committee with request to work for adoption of these principles in legislation before the State Legislature.

25. *Liaison Committee to California Medical Assistants Association*

Doctor Sanford Feldman, chairman, reported that in accordance with Resolution 11-64, urging uniformity in state college courses in medical assisting, the committee has held one meeting and planned additional meetings. He urged that liaison on this subject be continued.

ACTION: Voted to continue liaison with C.M.A.A. and others on uniformity in state college courses in medical assisting.

Doctor Feldman also reported that continuing interest in the placement of medical assistants in physicians' offices had been manifested and the committee had been asked to study and survey methods of such placement. He asked authority to continue the committee studies in this field.

ACTION: Authority voted for committee to continue studies on the placement of medical assistants.

Doctor Feldman further reported that the California Medical Assistants Association has appointed a study committee to survey the organizational structure of C.M.A.A. in an effort to make it a stronger and more meaningful association for its members.

26. *Commission on Medical Services*

Doctor Homer Pheasant, chairman of the Committee on Fees, presented to the Council a proposed revised edition of the Relative Value Studies, together with several changes proposed by the Commission on Medical Services, and proposed that the Council approve this revision as the 1964 edition of the Relative Value Studies.

ACTION: Proposed revised edition of Relative Value Studies, together with changes proposed by Medical Services Commission, approved and Committee on Fees thanked for its long and arduous task.

27. *Committee on Paramedical Personnel*

The committee proposed that a joint committee of representatives of the C.M.A., the California Hospital Association and the California Nurses Association be established to study the meaning of the surgical technician, their training, licensure and control.

ACTION: Approved formation of committee, chairman of Committee on Paramedical Personnel to name two C.M.A. representatives.

28. *Committee on Mental Health*

A statement on mental retardation prepared by the committee for use by state departments and voluntary health agencies was presented with the request for approval.

ACTION: Statement on mental retardation approved.

29. *Smoking*

Doctor Teall reported that Doctor Lester Breslow of the State Department of Public Health had proposed to the Commission on Public Agencies that a "Committee of 1,000" be formed among physicians who oppose smoking, this committee to create a nucleus for the distribution of anti-smoking pamphlets and other material.

ACTION: Referred to Bureau on Communications for study and report.

30. *Congress on Insurance and Prepayment Plans*

Chairman Anderson stated that he had been invited as a guest speaker at the Fourth National Conference of the A.M.A. Congress on Insurance and Prepayment Plans, to be held in Las Vegas on October 2 and 3, 1964, and asked authority to participate at C.M.A. expense.

ACTION: Authority voted for Doctor Anderson's participation.

Time and Place of Next Meeting

The chairman announced that the next Council meeting will be held in Los Angeles on September 19, 1964.

Adjournment

There being no further business to come before it, the meeting was adjourned at 5:00 p.m.

CARL E. ANDERSON, M. D., *Chairman*
MATTHEW N. HOSMER, M. D., *Secretary*

In Memoriam

Becker, Samuel William, Long Beach. Died August 15, 1964, in Hollywood, aged 70. Graduate of the University of Michigan Medical School, Ann Arbor, 1921. Licensed in California in 1956. Doctor Becker was an associate member of the Los Angeles County Medical Association.

✤

Beddoe, Paul, Alhambra. Died August 11, 1964, in Pasadena, aged 72, of acute myocardial infarction—coronary disease. Graduate of Western Reserve University School of Medicine, Cleveland, Ohio, 1929. Licensed in California in 1937. Doctor Beddoe was a retired member of the Los Angeles County Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✤

Cottrell, John C., Long Beach. Died September 2, 1964, in Long Beach, aged 62. Graduate of the University of Colorado School of Medicine, Denver, 1926. Licensed in California in 1929. Doctor Cottrell was a member of the Los Angeles County Medical Association.

✤

Cunningham, Terence Thomas, Jr., Huntington Park. Died August 16, 1964, in Downey, aged 48, of myocardial infarction. Graduate of Marquette University School of Medicine, Milwaukee, Wisconsin, 1942. Licensed in California in 1943. Doctor Cunningham was a member of the Los Angeles County Medical Association.

✤

Cutter, Richard Deidrich, Palo Alto. Died August 13, 1964, in Palo Alto, aged 55, of heart disease. Graduate of Stanford University School of Medicine, Palo Alto-San Francisco, 1935. Licensed in California in 1935. Doctor Cutter was a member of the Santa Clara County Medical Society.

✤

Davis, Harry William, San Francisco. Died August 30, 1964, in San Francisco, aged 68, of coronary thrombosis. Graduate of the College of Physicians and Surgeons of San Francisco, 1920. Licensed in California in 1920. Doctor Davis was a member of the San Francisco Medical Society.

✤

Hall, Colby, Encino. Died September 6, 1964, in Ventura, aged 59, of heart disease. Graduate of Washington University School of Medicine, St. Louis, Missouri, 1927. Licensed in California in 1930. Doctor Hall was a member of the Los Angeles County Medical Association.

✤

Huff, Miriam Pool, Los Angeles. Died August 16, 1964, in Los Angeles. Graduate of the University of Nebraska College of Medicine, Omaha, 1923. Licensed in California in 1928. Doctor Huff was a retired member of the Alameda-Contra Costa Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✤

Hutchinson, Emerson J., Los Angeles. Died August 19, 1964, aged 53. Graduate of the College of Osteopathic Physicians and Surgeons, 1934. Licensed in California in 1934. M.D. degree from California College of Medicine, 1962. Doctor Hutchinson was a member of the Forty First Medical Society.

✤

Hutchinson, Martin, Santa Rosa. Died August 15, 1964, in San Francisco, aged 50, of a coronary. Graduate of the University of California School of Medicine, Berkeley-San Francisco, 1940. Licensed in California in 1940. Doctor Hutchinson was a member of the Sonoma County Medical Society.

✤

Larsen, Jean M., Chula Vista. Died in an automobile accident August 25, 1964, in Mexico, aged 50. Graduate of the College of Medical Evangelists, Loma Linda—Los Angeles, 1939. Licensed in California in 1948. Doctor Larsen was a member of the San Diego County Medical Society.

✤

Lineer, Algot Siegfried, Los Angeles. Died August 25, 1964, in Los Angeles, aged 71, of heart failure secondary to pneumonectomy for carcinoma. Graduate of the University of Minnesota Medical School, Minneapolis, 1920. Licensed in California in 1921. Doctor Lineer was a member of the Los Angeles County Medical Association.

✤

McBride, Rexford William, San Mateo. Died August 26, 1964, in San Mateo, aged 65, of heart disease. Graduate of Stanford University School of Medicine, Palo Alto-San Francisco, 1927. Licensed in California in 1927. Doctor McBride was a member of the San Mateo County Medical Society.

✤

Wilson, P. Edward, Pasadena. Died August 5, 1964, in Pasadena, aged 63, of a coronary. Graduate of the College of Osteopathic Physicians and Surgeons, Los Angeles, 1936. Licensed in California in 1936. M.D. degree from the California College of Medicine, 1962. Doctor Wilson was a member of the Forty First Medical Society.

COMMITTEE ON COMMITTEE APPOINTMENTS

Approved by Council

August 7, 1964

1. Committee on Allied Health Agencies:
 Harold Griffeath, M. D.
 San Francisco
2. State Department of Public Health,
 Advisory Committee on Alcoholism:
 Nicholas John Khoury, M. D.
 Los Angeles
3. Committee on Medicine and Religion:
 Frank Glassy, M. D., Sacramento
 Albert Long, M. D., San Francisco
 Ronald Smith, M. D., Fresno
 Roger Barnes, M. D., Los Angeles, Chairman
 Max Nelson, M. D., San Diego
4. Committee on Continuing Education—Consulting Member:
 Roy Cohn, M. D., Professor of Surgery
 Associate Dean for Graduate Affairs
 Stanford University School of Medicine
5. Council ad hoc Committee to Review Representation in House of Delegates:
 Robert Hippen, M. D., San Diego
6. Scientific Board, Subcommittee on Libraries:
 David Rytand, M. D., Santa Clara

CMA CALIFORNIA MEDICAL ASSOCIATION

1965 Annual Scientific Assembly

San Francisco March 28-31, 1965

General Theme

VIROLOGY

Featured Speakers:

GEORGE GEE JACKSON, M.D. Professor of Medicine, University of Illinois, Chicago
C. HENRY KEMPE, M.D. Professor of Pediatrics, University of Colorado, Denver
HILARY KOPROWSKI, M.D. Director, The Wistar Institute, Philadelphia
IGOR TAMM, M.D. The Rockefeller Institute, New York City
ROBERT R. WAGNER, M.D. . . Professor of Microbiology, The Johns Hopkins University, Baltimore

CALL FOR SCIENTIFIC PAPERS, MEDICAL MOTION PICTURES AND SCIENTIFIC EXHIBITS

Your participation will make this assembly a success. If you have a paper (it need not be on virology) write to the appropriate Section Representative below.

PROGRAM REPRESENTATIVES OF THE SCIENTIFIC SECTIONS

ALLERGY Leo Melcher, M.D.
150 Arch Street, Redwood City

ANESTHESIOLOGY . . . Bruce M. Anderson, M.D.
439 - 30th Street, Oakland

DERMATOLOGY AND SYPHILOLOGY . . Charles George Steffen, M.D.
250 W. Badillo, Covina 91722

EAR, NOSE AND THROAT Thomas L. Soss, M.D.
333 N. San Mateo Drive, San Mateo
(Copy to: Irwin Harris, M.D.
4759 Hollywood Blvd., Los Angeles 90027)

EYE Byron H. Demorest, M.D.
5301 F Street, Sacramento 95819

GENERAL PRACTICE . . Leland B. Blanchard, M.D.
678 East Santa Clara Street, San Jose 95112

GENERAL SURGERY . . . Newlin Hastings, M.D.
1136 W. 6th Street, Los Angeles 90017

INDUSTRIAL MEDICINE AND SURGERY Rufus J. Walker, M.D.
4122 Holly Knoll Dr., Los Angeles 90027

INTERNAL MEDICINE . . James H. Thompson, M.D.
490 Post Street, San Francisco 94102

OBSTETRICS AND GYNECOLOGY Ralph L. Hoffman, M.D.
2111 Fifth Avenue, San Diego 92101

ORTHOPEDICS G. Wilbur Westin, M.D
2300 S. Hope Street, Los Angeles 90007

PATHOLOGY AND BACTERIOLOGY Melvin B. Black, M.D.
1580 Valencia Street, San Francisco 94110

PEDIATRICS Jack W. Bills, M.D.
14914 Sherman Way, Van Nuys 91405

PHYSICAL MEDICINE . . . O. Leonard Huddleston, M.D.
710 Wilshire Boulevard, Santa Monica

PREVENTIVE MEDICINE AND PUBLIC HEALTH Henrik L. Blum, M.D.
P. O. Box 871, Martinez

PSYCHIATRY AND NEUROLOGY Allen J. Enelow, M.D.
910 Via de la Paz, Palisades 90272
and
George Y. Abe, M.D.
Metropolitan State Hospital, Norwalk 90650

RADIOLOGY John C. Bennett, M.D.
2200 Hayes Street, San Francisco 94117

UROLOGY Carl K. Pearlman, M.D.
1518 N. Sycamore, Santa Ana

If you have a medical motion picture or a scientific exhibit, write the California Medical Association Committee on Scientific Assemblies, 693 Sutter Street, San Francisco, for application forms today.

PLAN NOW TO ATTEND THE 1965 ANNUAL SCIENTIFIC ASSEMBLY

PUBLIC HEALTH REPORT

MALCOLM H. MERRILL, M.D., M.P.H.
Director, State Department of Public Health

SWIMMING will be permitted in a limited area in the Santee Water Reclamation Project in San Diego County if strict sanitary safeguards are maintained.

This action followed recommendations by the department's Epidemiology Advisory Committee to the Santee Project that biological, hydrological, bacteriological and virological information shows that certain areas of the Santee development can be opened to broader recreational use.

The recommendations carried these provisos: that the proposed swimming area be developed and maintained in accordance with established standards for artificial pools in California, and that the San Diego County Health Department maintain a constant laboratory surveillance and continued evaluation of the recreational programs.

The Santee project for reclaiming waste waters for recreational uses extends well beyond local and state interests and if its full potential can be realized will be of benefit in other areas which suffer from a water shortage.

* * *

The department's Hospital Advisory Board has forwarded to the State Board of Public Health for adoption a revision of hospital regulations which deletes from the current regulation any reference to visitors in delivery rooms.

Favorable action by the State Board of Public Health will close 10 years of discussion on the subject.

The subject was reconsidered by the advisory board last year after testimony indicated an increased interest in the development of family centered maternity care in the United States and other countries. If the State Board of Public Health at a later date adopts the recommendation the decision as to admission of fathers or other visitors to delivery rooms will be made by the individual hospitals and their medical staffs.

* * *

The Governor's Advisory Committee on Cigarette Smoking and Health has nearly completed its assignment. It is anticipated the group's recommendations for a state program to control the smoking of cigarettes as a hazard to health will be submitted to Governor Brown this month.

In general the advisory committee is considering for recommendation coordinated programs in education, research, training and withdrawal clinics, with these activities possibly supported by an increased state cigarette tax.

Educational activities would concentrate on youngsters who have not yet started to smoke. Also being considered is a state-financed research program in tobacco and health, embracing investigations in medicine, epidemiology, chemistry, physiology, behavioral science and consumer practices.

* * *

California along with the rest of the nation is planning dynamic and vigorous programs to improve the lot of the mentally retarded. Public Health is one of the many resources which must be put into play to protect children from the debility of mental retardation.

Public health, through historical tradition and modern practice, is in a position to make a substantial contribution toward realizing current expectations for improving services for the mentally retarded, and for preventive measures.

Customarily public health seeks comprehensive and community-wide planning in the development of needed services, with the aim of incorporating them into the mainstream of health care. This results in the best care.

As its part in broad, statewide programs for the mentally retarded, the State Health Department has recommended the following:

1. Establishment of a department unit with qualified staff to mobilize public health resources for the attack on mental retardation.

2. Expansion of Crippled Children Services by specifically augmenting existing medical facilities to establish comprehensive diagnostic and counselling services for cases and suspected cases of mental retardation.

3. The expansion of the Maternal and Child Health program by intensifying those services which are aimed in part at curtailing mental retardation in high risk groups of the population.

4. Step up research toward prevention, early detection, and management of mental retardation, including the establishment of a Human Genetics Unit in the department.

Help!

THE PHYSICIAN'S REASON for being is to provide help for those in need. And help is the purpose of the Woman's Auxiliary to the California Medical Association. We are ready, willing and able to help in any way asked.

In this age of medical legislation, what better way to help the cause of free medicine than through sincere and willing service to the community?

Your Woman's Auxiliary has just such a service program. It includes Safety, Disaster Preparedness, Blood Banks, Youth Fitness, Rural Health, Mental Health, Problems of the Aging, Homemaker Service, Baby-Sitter courses, Anti-Smoking campaigns, Sports Injury conferences, Child Guidance Clinic work, Immunization campaigns, dissemination of information on Quackery, and many more.

Have you heard about GEMS (Good Emergency Mother Substitutes)? It's our baby-sitter course, taught over a period of weeks by a physician, nurse, policeman and fireman and it includes child care, first aid, safety tips, behavior problems, etc. Who took the course? In the last year your Woman's Auxiliary gave diplomas to 4,125 GEMS (2,500 in Santa Clara District 1 alone) including girls, boys, senior citizens and even new parents themselves.

Under Disaster Preparedness (formerly Civil Defense) is Medical Self-Help. Whereas First Aid courses teach what to do *until* the doctor arrives, Medical Self-Help is designed to teach what to do if the doctor *does not* arrive. It is the plan of the American Medical Association that one member in every family have this course. In San Mateo County this year physicians and their Woman's Auxiliary taught 5,000 persons medical self-help.

In Sacramento County the Woman's Auxiliary has organized teen-age volunteers for hospitals. The 15 to 18 year olds are called "Minute Maids" and the 13 to 15 year olds are the "Band Aids."

In San Francisco County the Woman's Auxiliary is providing 46 indigent senior citizens with prepared and delivered meals, aptly called "Meals on Wheels."

Your Woman's Auxiliary is responsible for establishing and staffing blood banks in ten California counties.

Service is the tradition of doctors of medicine, and therefore becomes our tradition. Your Woman's Auxiliary has given hundreds of thousands of hours of service to your community this year.

There is no more challenging and stimulating avenue for the wife than to serve her husband's profession as a trained, active Auxiliary member.

MRS. JOHN FITTIPOLDI, JR.
Community Service Chairman
Woman's Auxiliary to the
California Medical Association

INFORMATION

Data on Consumer Expenditures, Los Angeles and San Francisco, 1960

A Report of the Bureau of Research and Planning, California Medical Association

Recently published data on consumer expenditures in Los Angeles and San Francisco by the Bureau of Labor Statistics show:

- Average family incomes in 1960 had increased by 50 per cent over 1950; from around $4,000 to over $6,000.
- Current consumption expenditures increased between 40 per cent and 50 per cent over the ten year interval.
- Medical care expenditures took a larger share of the consumer budget, having increased in both cities from under 6 per cent to about 7 per cent of current consumption expenditures.
- Expressed as a per cent of current consumption expenditures, medical care expenditures: rise with family income; appear to be unrelated to family size; increase with age of the head of the household.
- The relative changes in expenditure patterns on a national level has resulted in a revision in the weighting structure of the Consumer Price Index. Medical care, which formerly accounted for 5.88 per cent of the overall index, has been adjusted downward to 5.70 per cent.

THE BUREAU of Labor Statistics has recently issued detailed reports which compare consumer expenditure data for the years 1950 and 1960 for both Los Angeles and San Francisco. In this report the Bureau of Research and Planning discusses the results of their findings.

Several observations should be made at the outset of these considerations: it appears that the Bureau of Labor Statistics samples are not completely representative of the populations discussed; the samples are small, and seem to vary somewhat in composition from the actual composition of the populations in the two metropolitan areas. Unrelated individuals are considered as family units, hence the figures for average family income are lower than if the unrelated individuals and the families had been considered separately. One should also bear in mind that the data for San Francisco are not comparable with those for Los Angeles. Within limits, however, there is much information to be gained from this study.

Table 1 shows the average family (families and single consumers) annual income for 1950 and 1960 as well as per cent changes over the 10-year period. In 1960 the average San Francisco family earned $6,154 after taxes; 49 per cent more than the $4,128 earned ten years earlier. Los Angeles families averaged $6,361 after taxes, an increase of 52 per cent over their 1950 earnings. Average family size within the samples from the two cities is a factor to be considered in assessing income figures, both before and after taxation, since family size was larger in Los Angeles than in San Francisco. From the figures at hand, one can probably say with some safety that average family incomes have increased approximately 50 per cent in the 10-year period.

Source: U.S. Department of Labor, Bureau of Labor Statistics, Survey of Consumer Expenditures, *Consumer Expenditures and Income*, (San Francisco and Los Angeles, 1960), B.L.S. Reports Numbers 237-2, November 1962, and 237-22, May 1963.

Table 2 shows current consumption expenditures and per cent changes from 1950 to 1960. Current consumption expenditures (expenditures after eliminating income taxes, personal property taxes, gifts and contributions, and personal insurance) are defined as being the cost of any purchase made during the survey year regardless of whether payment is actually made during the year. The table indicates that between 1950 and 1960 current consumption expenditures increased 41 per cent in San Francisco and 48 per cent in Los Angeles.

Tables 3 through 6 detail medical care expenditures as dollar amounts and as percentages of current consumption, and income before and after

TABLE 1.—*Average Family (Families and Single Consumers) Money Income 1960 and 1950, Los Angeles and San Francisco*

Metropolitan Area	Average Family Money Income Before Taxes		Average Family Money Income After Taxes		Per Cent Increase 1950 to 1960	
	1960	1950	1960	1950	Before Taxes	After Taxes
Los Angeles	$7,050	$4,547	$6,361	$4,185	55.0	52.0
San Francisco ..	7,110	4,551	6,154	4,129	56.2	49.0

TABLE 2.—*Average Family (Families and Single Consumers) Expenditures for Current Consumption, 1960 and 1950, Los Angeles and San Francisco*

Metropolitan Area	Average Current Consumption Expenditures per Family		Per Cent Increase 1950 to 1960
	1960	1950	
Los Angeles	$6,154	$4,150	$48.3
San Francisco....	5,705	4,048	40.9

TABLE 3.—*Average Family (Families and Single Consumers) Medical Care Expenditures as Per Cent of Current Consumption Expenditures and Money Income, 1960 and 1950, Los Angeles and San Francisco*

Metropolitan Area	Average Medical Care Expenditures per Family		Per Cent Increase 1950 to 1960	Average Medical Care Expenditures as Per Cent of: Current Consumption Expenditures		Money Income After Taxes		Money Income Before Taxes	
	1960	1950		1960	1950	1960	1950	1960	1950
Los Angeles	$441	$241	83.0	7.2	5.8	6.9	5.8	6.3	5.3
San Francisco	393	235	67.2	6.9	5.8	6.4	5.7	5.5	5.2

TABLE 4.—*Family Medical Care Expenditures Related to Money Income and Current Consumption Expenditures, Los Angeles and San Francisco, 1960*

Metropolitan Area	Total	Money Income After Taxes: Under $1,000	$1,000 to $1,999	$2,000 to $2,999	$3,000 to $3,999	$4,000 to $4,999	$5,000 to $5,999	$6,000 to $7,499	$7,500 to $9,999	$10,000 to $14,999	$15,000 and Over
Los Angeles—											
Average—											
Family size	3.1	1.0	1.2	1.9	2.0	3.0	2.9	3.4	4.0	4.2	4.2
Money income before taxes	$7,050	$606	$1,720	$2,648	$3,896	$5,079	$6,010	$7,382	$9,507	$13,160	$20,865
Money income after taxes	6,361	606	1,677	2,543	3,527	4,636	5,496	6,685	8,582	11,567	17,906
Expenditures for current consumption	6,154	980	1,892	2,688	4,075	4,336	5,038	7,305	8,180	9,639	15,765
Medical care	441	73	228	206	248	390	375	572	485	647	899
Medical care as per cent of current consumption expenditures	7.2	7.4	12.0	7.7	6.1	9.0	7.4	7.8	5.9	4.9	5.7
San Francisco—											
Average—											
Family size	2.7	1.0	1.4	1.9	1.6	2.2	3.5	3.3	3.3	3.3	3.0
Money income before taxes	$7,110	$442	$1,591	$2,593	$3,762	$4,904	$5,893	$7,688	$10,046	$13,573	$34,214
Money income after taxes	6,154	662	1,580	2,493	3,519	4,495	5,339	6,822	8,613	11,803	21,685
Expenditures for current consumption	5,705	956	2,017	2,755	3,547	4,630	5,012	6,763	7,791	9,675	13,567
Medical care	393	15	123	242	279	244	465	442	591	554	853
Medical care as per cent of current consumption expenditures	6.9	1.6	6.0	8.0	7.9	5.3	9.3	6.5	7.5	5.7	6.3

TABLE 5.—*Family Expenditures and Income, by Family Size. All Urban Families and Single Consumers, Los Angeles, California, 1960*

Metropolitan Area	Total	Family Size: Single Consumer	Two Persons	Three Persons	Four Persons	Five Persons	Six or More
Los Angeles—							
Average—							
Family size	3.1	1.0	2.1	3.2	4.0	5.0	7.2
Money income before taxes	$7,050	$4,111	$6,754	$7,761	$8,548	$9,088	$8,525
	6,361	3,644	6,022	6,888	7,724	8,331	8,092
Expenditures for current consumption	6,154	3,421	5,776	6,878	7,825	8,035	7,326
Medical care	441	240	466	483	551	428	581
Medical care as per cent of current consumption expenditures	7.2	7.0	8.1	7.0	7.0	5.3	7.9
San Francisco—							
Average—							
Family size	2.7	1.0	2.0	3.1	4.1	5.0	6.9
Money income before taxes	$7,110	$3.636	$7,366	$9,777	$8,735	$8,260	$7,117
Money income after taxes	6,154	3,254	6,242	8,061	7,769	7,462	6,830
Expenditures for current consumption	5,705	2,657	5,792	7,065	7,599	8,417	6,488
Medical care	393	159	413	556	455	610	416
Medical care as per cent of current consumption expenditures	6.9	6.0	7.1	7.9	6.0	7.2	6.4

TABLE 6.—*Family Expenditures and Income, by Age of Family Head, All Urban Families and Single Consumers, Los Angeles, California, 1960*

Metropolitan Area	Total	Age of Family Head in Years						
		Under 25	25 to 34	35 to 44	45 to 54	55 to 64	65 to 74	75 and Over
LOS ANGELES—								
Average—								
Family size	3.1	2.6	3.2	4.2	3.2	1.8	1.8	1.7
Money income before taxes	$7,050	$5,406	$7,142	$8,388	$9,394	$4,804	$5,047	$3,696
Money income after taxes	6,361	4,880	6,448	7,636	8,174	4,385	4,676	3,564
Expenditures for current consumption	6,154	4,960	6,718	7,273	7,468	4,351	3,895	3,230
Medical care	441	401	426	446	474	475	401	464
Medical care as per cent of current consumption expenditures	7.2	8.1	6.3	6.1	6.3	10.9	10.3	14.4
SAN FRANCISCO—								
Average—								
Family size	2.7	2.8	3.2	3.8	2.7	2.1	1.6	1.4
Money income before taxes	$7,110	$5,651	$7,203	$7,456	$8,032	$8,294	$5,763	$5,780
Money income after taxes	6,154	5,137	6,431	6,679	7,071	7,043	4,646	4,017
Expenditures for current consumption	5,705	5,755	6,331	6,670	6,443	5,756	3,698	3,025
Medical care	393	353	379	361	468	526	310	282
Medical care as per cent of current consumption expenditures	6.9	6.1	6.0	5.4	7.3	9.1	8.4	9.3

TABLE 7.—*Average Expenditures, Income, and Savings of All Urban Families and Single Consumers*

Item	Average per Family		Per Cent Change, 1950 to 1960	Per Cent of Expenditures for Current Consumption	
	1960	1950		1960	1950
LOS ANGELES—					
Expenditures for current consumption	$6,154	$4,150	48.3	100.0	100.0
Food and beverages	1,569	1,241	26.4	25.5	29.9
Tobacco	98	58	69.0	1.6	1.4
Housing, total	1,721	1,101	56.3	27.9	26.5
Shelter, fuel, light, refrigeration and water	1,042	597	74.5	16.9	14.4
Household operations	372	211	76.3	6.0	5.1
Housefurnishings and equipment	298	293	1.7	4.8	7.1
Clothing, materials, services	544	429	26.8	8.8	10.3
Personal care	157	88	78.4	2.5	2.1
Medical care	441	241	83.0	7.2	5.8
Recreation	282	199	41.7	4.6	4.8
Reading and education	93	54	72.2	1.5	1.3
Automobile purchase and operation	1,002	614	63.2	16.3	14.8
Other transportation	79	70	12.9	1.3	1.7
Other expenditures	167	55	203.6	2.7	1.3
Gifts and contributions	274	187	46.5		
Personal insurance	303	178	70.2		
SAN FRANCISCO—					
Expenditures for current consumption	5,705	$4,048	40.9	100.0	100.0
Food and beverages	1,534	1,271	20.7	26.9	31.4
Tobacco	78	64	21.9	1.4	1.6
Housing, total	1,657	1,069	55.0	29.0	26.4
Shelter, fuel, light, refrigeration and water	1,002	604	65.9	17.6	14.9
Household operations	347	192	80.7	6.1	4.7
Housefurnishings and equipment	301	274	9.9	5.3	6.8
Clothing, materials, services	523	450	16.2	9.2	11.1
Personal care	151	90	67.3	2.6	2.2
Medical care	393	235	67.2	6.9	5.8
Recreation	282	187	50.8	4.9	4.6
Reading and education	118	62	90.3	2.1	1.5
Automobile purchase and operation	737	469	57.1	12.9	11.6
Other transportation	119	83	43.4	2.1	2.1
Other expenditures	113	68	66.2	2.0	1.7
Gifts and contributions	402	155	159.4		
Personal insurance	332	187	77.5		

taxes. Considering dollar expenditures only, increases of 83 per cent in Los Angeles and 67 per cent in San Francisco over the 10-year period are indicated. Viewing medical care expenditures as a fraction of the consumer dollar, it can be seen from Table 3 that the per cent of expenditures apportioned to medical care has moved up from under 6 per cent in both cities to approximately 7 per cent.

Table 4 shows that, in general, the amount of medical care expenditures, expressed as a per cent of current consumption expenditures, decreased with increased family income, (for example, in Los Angeles, families which earn between $1,000 and $1,999 use 12 per cent of their expenditures on medical care; families which earn between $4,000 and $4,999 expend 9 per cent; families which earn over $15,000 expend 5.7 per cent on medical care), although the absolute value of expenditures increased with family income.

Table 5 shows per cent of current consumption expenditures for medical care expenditures by family size for the two cities. There seems to be little pattern shown in either city as to a relationship between the two factors. The two-person family spends the most in Los Angeles (8.1 per cent). In San Francisco the three-person family spends more on medical care than do others (7.9 per cent). This is very likely due to the small size of the samples.

Table 6 shows that the fraction of expenditures spent on medical care increases with age of the family head. There is a sharp upswing in both cities after age 55.

An interesting fact about medical care expenditures (not shown in the tables) is that in San Francisco more than one-fourth of the total medical care expenditures were for "premiums on hospitalization, surgical, and other forms of health insurance or health service plans." Four out of five San Francisco families are so covered. More than one-fifth of medical care expenditures in Los Angeles were for such premiums, with three out of four families covered.

Table 7 shows the distribution of consumer dollars in 1960 and 1950. A "new series" of the national Consumer Price Index, initiated in January, 1964, has been revised on the basis of these and other city expenditure surveys. The weight assigned to medical care is now 5.70; down from the weight of 5.88 in the "old series." National data, then, contrast with relative expenditure patterns in San Francisco and Los Angeles, both of which showed increases in the proportion spent on medical care.

693 Sutter Street, San Francisco, California 94102.



NEWS & NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

A two-day postgraduate seminar will be combined with the **Thirteenth Annual Clifford D. Sweet Lecture** to be held at Children's Hospital of the East Bay in Oakland April 9 and 10, 1965.

The speakers will be: Dr. Richard Smith, professor and chairman of the department of pediatrics, University of Florida School of Medicine, and Dr. Lester W. Martin, a pediatric surgeon at Children's Hospital, Cincinnati, Ohio. Dr. Smith will speak on infectious diseases and he will deliver the Sweet Lecture (the subject to be announced later). Dr. Martin will talk on pediatric surgery problems.

LOS ANGELES

The seventeenth annual **Midwinter Radiological Conference,** sponsored by the Los Angeles Radiological Society, will be held at the Biltmore Hotel, Los Angeles, California, on Saturday, January 30 and Sunday, January 31, 1965. The program will feature the following speakers: Professor Olle Olsson, University Clinics, Lund, Sweden; Donald L. McRae, M.D., McGill University, Montreal, Canada; Harry Z. Mellins, M.D., State University of New York, Downstate Medical Center, Brooklyn, New York; Vincent P. Collins, M.D., Baylor University, Houston, Texas; and Dr. Eric Samuel, Edinburgh, Scotland. Further information may be obtained from Dr. John L. Gwinn, Childrens Hospital, 4614 Sunset Boulevard, Los Angeles 90027.

* * *

The John A. Hartford Foundation, Inc., of New York, has given the **University of Southern California School of Medicine** a $488,661 grant to continue a full-scale investigation into the causes and treatment of shock. The grant will support USC's Shock Research Unit, established in the Los Angeles County General Hospital in November, 1961, under an earlier $423,476 grant from the Hartford Foundation.

* * *

Dr. Thomas H. Brem, professor and chairman of the department of medicine at the USC School of Medicine, has been elected to a second term as chairman of the American Board of Internal Medicine—a position normally held for only one year. Dr. Brem has been a member of the Board since 1955.

RIVERSIDE

The annual meeting of the **Pacific Coast Fertility Society** will be held at the El Mirador Hotel in Palm Springs, Thursday, November 12 through Sunday, November 15.

Guest speakers will include F. Guttmacher, M.D., New York, President of Planned-Parenthood-World Population; Georgeanna Seegar Jones, M.D., Associate Professor of Gynecology and Obstetrics, Johns Hopkins University School of Medicine; Howard W. Jones, M.D., Associate Professor of Gynecology and Obstetrics, Johns Hopkins University School of Medicine; H. A. Riva, M.D., Professor and Chairman, Department of Obstetrics and Gynecology, Seton Hall College of Medicine and Dentistry; John Rock, M.D., Director, Rock Reproductive Clinic, Inc., Brookline, Massachusetts, and Clinical Professor (Emeritus) of Gynecology, Harvard Medical School; and Herbert H. Thomas, M.D., Assistant Professor of Gynecology, Medical College of Alabama.

On Friday evening, Dr. Guttmacher will moderate a special panel discussion on Therapeutic Abortions. Breakfast round tables, selected motion pictures and presentations of papers will be featured during the four-day meeting.

Further information and registration form can be obtained from the Pacific Coast Fertility Society, 5410 Wilshire Blvd., Los Angeles 90036.

SAN FRANCISCO

The Section of Therapeutic Radiology and the Section of Radiobiology of the Department of Radiology, University of California School of Medicine, San Francisco, are now offering a four-year basic and clinical **training program in radiation therapy** under the auspices of the National Cancer Institute of the National Institutes of Health. The program is conducted jointly by Dr. Franz Buschke and Dr. Harvey Patt. Further information may be obtained from Dr. Buschke, Department of Radiology, University of California Medical Center, San Francisco, California 94122.

SANTA CLARA

Dr. Rose Payne, a research associate in the Department of Medicine of Stanford University School of Medicine, received the 1964 **John Elliott Memorial Award** of the American Association of Blood Banks at the organization's annual meeting in Washington, D.C., late last month. She is being honored, said Rosser L. Mainwaring, the association's president, for her work in typing white blood cells and in determining their significance in producing a potentially dangerous reaction following transfusion. Dr. Payne received a scroll and $500.

EDUCATION NOTICES

Meetings and Courses

COMMITTEE ON CONTINUING MEDICAL EDUCATION

THIS BULLETIN of the dates of continuing education programs and the meetings of various medical organizations in California is supplied by the Committee on Continuing Medical Education of the California Medical Association. In order that they may be listed here, please send communications relating to your future meetings or postgraduate courses to Committee on Continuing Medical Education, California Medical Association, 693 Sutter Street, San Francisco, California 94102.

Medical Meetings

October 16-17—**Western Industrial Medical Association.** Biltmore Hotel, Los Angeles. Friday-Saturday. Contact: Christine Einart, M.D., executive secretary, 2151 Berkeley Way, Berkeley 4.

October 23-25—**California Society of Internal Medicine.** Mark Thomas Hotel, Monterey. Friday-Sunday. Contact: Mrs. Nancy V. Louw, executive secretary, 350 Post Street, San Francisco 94108.

October 25-28—**California Academy of General Practice 16th Annual Scientific Assembly.** Hilton Hotel, San Francisco. Sunday-Wednesday. Sir John Bruce, Professor of Clinical Surgery, University of Edinburgh, Scotland, will be one of the principal speakers. Contact: Academy of General Practice, No. 9 First Street, San Francisco.

NOVEMBER MEETINGS

November 3-6—**Present Concepts in Internal Medicine.** Letterman General Hospital, San Francisco. Tuesday-Friday. Contact: Commanding General, Attn.: MEDES-PT, Letterman General Hospital, San Francisco 94129.

November 4-7—**Nevada State Medical Association and Reno Surgical Society—Joint Meeting.** Reno, Nevada. Wednesday-Saturday. Registration: $20. Contact: Nelson B. Neff, executive secretary, Nevada State Medical Association, 3660 Baker Lane, Reno.

November 7—**Forty First Medical Society Convention: "Man's Reaction to Catastrophe."** Riviera Hotel, Palm Springs. Saturday. Contact: John M. Addington, administrative director, Forty First Medical Society, 4775 Santa Monica Blvd., Los Angeles 90029.

November 11-12—**Pacific Coast Fertility Society Symposium. "Population Growth—A Medical Responsibility."** El Mirador Hotel, Palm Springs. Contact: Miss Dee Davis, executive secretary, Pacific Coast Fertility Society, 5410 Wilshire Blvd., Los Angeles 90036.

November 12-15—**Annual Meeting of the Pacific Coast Fertility Society.** El Mirador Hotel, Palm Springs. Fee: $15 members, $25 non-members. Contact: Pacific Coast Fertility Society, 5410 Wilshire Blvd., Los Angeles 90036.

November 12-15—**San Diego Chapter of the California Academy of General Practice Scientific Symposium.** Flamingo Hotel, Las Vegas. Contact: Vincent F. Biondo, M.D., 5548 El Cajon Blvd., San Diego 92115.

November 14—**Annual Institute in Child Psychiatry for Pediatricians.** Reiss-Davis Clinic for Child Guidance. Co-sponsored by the Southern California Chapter of the American Academy of Pediatrics. Saturday. Contact: R. L. Motto, M.D., director, Reiss-Davis Clinic, 9760 West Pico Blvd., Los Angeles 90035.

DECEMBER MEETINGS

December 1-4—**Annual Presentation of the Postgraduate Course in Cardiology: "The Heart in the Electronic Age."** Scripps Clinic and Research Foundation, La Jolla. Tuesday-Friday. Contact: Harold M. Lowe, M.D., Scripps Clinic and Research Foundation, 476 Prospect Street, La Jolla.

December 2-4 — **West Coast Allergy Society Annual Meeting.** Ambassador Hotel, Los Angeles. Wednesday-Friday. Contact: Jack M. Chesebro, executive secretary, 1818 S.E. Division, Portland 2.

December 9—**Symposium Seminars on Respiratory Disease.** Sponsored by the Tuberculosis and Health Association of Alameda County. Jack London Inn, Jack London Square, Oakland. Wednesday. Contact: E. Ronald Riggall, M.D., program chairman, 121 East 11th Street, Oakland 6.

FUTURE MEETINGS IN 1965

January 16—**Annual Symposium on Heart Disease.** Orange County Medical Association Building, 300 South Flower, Orange. Saturday. Contact: Howard G. Buswell, executive director, Orange County Heart Association, P.O. Box 1704, Santa Ana 92703.

January 20—**Annual Midwinter Symposium on Heart Disease.** Statler Hilton Hotel, Los Angeles. Wednesday. Contact: Mr. Chauncey Alexander, executive director, Los Angeles County Heart Association, 2405 West 8th Street, Los Angeles 90057.

January 22-24—**Annual Meeting of the Southern California Chapter, American College of Surgeons.** Palm Springs. Sunday-Tuesday. Contact: Russell Smith, M.D., chairman, 1930 Wilshire Blvd., Los Angeles.

January 27-30 — **The American Group Psychotherapy Association.** San Francisco. Wednesday-Saturday. Contact: Donald A. Shaskan, M.D., president, 49 Fourth Street, San Francisco.

January 29-31—**Clinical Conference in Pediatric Anesthesiology.** Childrens Hospital of Los Angeles. Friday-Sunday. Contact: M. Digby Leigh, M.D., Childrens Hospital of Los Angeles, 4614 Sunset Boulevard, Los Angeles 90027.

February 13-14 — **Pediatric Surgery Symposium.** Presented by Childrens Hospital of Los Angeles. Saturday-Sunday. Contact: Newlin Hastings, M.D., program chairman, 4614 Sunset Blvd., Los Angeles 90027.

February 20-21—**Pediatric Urologic Seminar.** Childrens Hospital, Los Angeles. Saturday-Sunday. Contact: H. H. Edelbrock, M.D., 6753 Hollywood Blvd., Los Angeles 90028.

March 28-31—**CALIFORNIA MEDICAL ASSOCIATION 94th Annual Session.** Scientific theme: "Urology." Fairmont Hotel, Mark Hopkins Hotel, San Francisco. Sunday-Wednesday. Contact: Mr. John Hunton, executive secretary, 693 Sutter Street, San Francisco 94102.

April 4-8—**Annual Clinical Meeting of the American College of Obstetricians and Gynecologists.** Civic Auditorium, San Francisco. Sunday-Thursday. Contact: Robert A. Kimbrough, M.D., director, 79 West Monroe Street, Chicago 60603.

April 9-15—**American Academy of General Practice.** San Francisco. Friday-Thursday. Contact: Mac F. Cahal, J.D., Volker Boulevard at Brookside, Kansas City 12, Mo.

Postgraduate Education

Audio-Digest Foundation

Audio-Digest Foundation (a non-profit subsidiary of the California Medical Association) provides by subscription twice-a-month tape-recorded summaries of leading national meetings and authoritative surveys of current literature. Seven separate services in: General Practice, Surgery, Internal Medicine, Obstetrics-Gynecology, Pediatrics, Anesthesiology, and Ophthalmology. A new Catalog of outstanding lectures and panel discussions in all areas of medical practice is also available. For information, write: Mr. Claron L. Oakley, Editor, 619 South Westlake Avenue, Los Angeles.

Presbyterian Medical Center

November 14—**Gastroenterology.** Saturday. 8 hours. $25.

December 12—**Minor Surgery, Office and Hospital.** Saturday. 8 hours. $25.

January 9—**Office Diagnosis and Treatment.** Saturday. 8 hours. $25.

January 23—**Diabetes Mellitus.** Saturday. 8 hours. $25.

February 6—**Current Dermatologic Therapy.** Saturday. 8 hours. $25.

For information contact: Arthur Selzer, M.D., chairman, Education Committee, Presbyterian Medical Center, Clay and Webster Streets, San Francisco 94115. WEst 1-8000.

University of California at Los Angeles

October 17-November 7—**Workshop on Mental Retardation.** Saturdays. October 17: San Francisco, October 24: San Diego, October 31: Fresno, November 7: Riverside. 6½ hours. $2.25—lunch.

October 16-November 6—**Postgraduate Medical Lecture Series in Australia and New Zealand.** Monday-Friday. 32 hours. $200.

October 21-April 21—**Basic Science Course in Ophthalmology.** Wednesdays. Lecture: 49 hours, lab: 31½ hours. $175—full course.

November 14-15—**Arthritis and Rheumatism.** Saturday-Sunday. 10 hours. $15.

November 20-21—**Surgical Techniques Utilizing the Isolated Intestinal Segment in Urological Procedures.** Friday-Saturday. 8 hours. $175.

November 30-December 11—**Prosthetics-Orthotics.** Monday-Friday. 90 hours. $200.

December 14-18—**Child Amputee Prosthetics.** Monday-Friday. 45 hours. $125.

January 13-May 12—**Teaching Clinics in Psychiatry.** Wednesday evenings. 36 hours. $25.

February 1-2—**Practical Application of Neuroradiological Techniques.** Monday-Tuesday. 12 hours. $50.

February 6-7—**Venereal Disease.** Saturday-Sunday. 12 hours.*

February 17-April 7—**Medical Economics.** Wednesdays. 16 hours. $35.

February 27-28—**Early Management of Acute Trauma.** Saturday-Sunday. 12 hours.*

February 20—**Concepts of Mental Health Consultation.** Saturday. 7 hours. $25.

For information on courses for physicians or ancillary personnel contact: Thomas H. Sternberg, M.D., Assistant Dean and Head, Department of Continuing Education in Medicine and Health Sciences, U.C.L.A. Medical Center, Los Angeles 90024, 478-9711, Ext. 2114.

Loma Linda University

As Arranged—**Traineeships** in clinical and other departments are available by arrangement with department chairmen of the Postgraduate Division. 80 hours minimum.

Anesthesia, 6 months. 250-300 hours. $350.

Pulmonary Diseases—can be arranged.

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For course information contact: W. F. Norwood, Ph.D., Assistant Dean and Chairman, Division of Continuing Education, Loma Linda University School of Medicine, 1720 Brooklyn Ave., Los Angeles, California 90033, ANgelus 9-7241, Ext. 214.

University of California, San Francisco

September 8-April 27—**Radiological Physics.** Tuesday evenings. 45 hours. $150.

September 15-December 8—**Medical Radio Conferences.** Northern California.*†

September 17-December 10—**Medical Radio Conferences.** Northern California.*†

September 18-October 23—**Neuropsychiatric Management in Daily Practice.** Modesto State Hospital. Friday evenings. 12 hours. $10.

September 22-October 27—**Mental Retardation: Problems and Approaches.** Sonoma State Hospital. Tuesday evenings. 12 hours. $10.

September 23-December 16—**Psychotherapeutic Principles and Practice for Non-Psychiatrists.** Langley Porter Neuropsychiatric Institute. Wednesdays. 72 hours. $25.

September 24-October 29 — **Psychosomatic Aspects of Daily Practice.** Napa State Hospital. Thursday evenings. 12 hours. $10.

September 29-November 3 — **Clinical Considerations in Mental Retardation.** Sonoma.*†

October 6-December 8—**Evening Lectures in Medicine.** Oakland Hospital. Tuesday evenings. 16 hours. $35.

October 13-November 24—**Neuropsychiatry in Daily Practice.** Agnews State Hospital. Tuesday evenings. 12 hours. $10.

October 16-17—**Surgery of the Hand and Forearm.** Friday-Saturday. 14 hours. $40.

October 17—**Infectious Diseases in Childhood.** Children's Hospital. Saturday. 6 hours. $15.

October 30-November 1—**Symposium on Mental Retardation for General Practitioners, Non-Psychiatrists and Paramedical Specialists.***†

*Fee to be announced.
†Hours to be announced.

November 7-8 — **Postgraduate Seminar in Psychiatry.** Fresno Community Hospital. Saturday-Sunday. $10.†

November 7-December 12 — **Postgraduate Seminars in Clinical Sciences.** Mercy Hospital. Saturday mornings. 12 hours.*

November 13-15—**Mental Retardation: Recent Advances and Their Implications for Treatment.** Friday-Sunday. 10 hours. $15.

November 21-22—**Epilepsy: Problems of Diagnosis and Management.** 14 hours. $40.

November 21-22 — **Problems in Community Mental Health.** Saturday-Sunday.*†

November 22-24—**Neurology.** Sunday-Tuesday.*†

December 2-5—**Retinal Diseases: A Symposium on Differential Diagnostic Problems of Posterior Uveitis.** Wednesday-Saturday. 25 hours. $85.

December 4-5—**Basic Electrocardiography.** Friday-Saturday. 12 hours. $40.

December 12-13—**Psychiatric Perspectives in Medicine.** Stockton State Hospital. Saturday-Sunday. 13 hours. $10.

January 9—**Current Practices and Future Trends in Obstetrics.** Children's Hospital, San Francisco. Saturday.*†

January 16-17—**Biopsy and Aspiration Techniques in Diagnosis.** Saturday-Sunday.*†

February 1—**Medical Aspects of Well Being.** Monday.*†

February 3-5—**Aviation Medicine Seminars.** Del Webb's TowneHouse, San Francisco. Wednesday-Friday.*†

February 11-13—**Pediatric Ophthalmology.** Thursday-Saturday.*†

February 15-19—**Course for Physicians in General Practice.** Mount Zion Hospital, San Francisco. Monday-Friday.*†

February 18-20—**Skin Bacteria and Their Role in Infection.** Thursday-Saturday. 15 hours. $35.

February 20-22—**Selecting Children for Special Educational Services.** Saturday-Monday.*†

February 26-27—**Clinical Neurology.** Friday-Saturday.*†

February 27-28—**Neuropsychiatric Management in Daily Practice.** Modesto State Hospital, Modesto. Saturday-Sunday.*†

Continuously—Courses presented by special arrangement: **Principles and Clinical Uses of Radioisotopes** (full time, one to three months).

For information on courses for physicians or ancillary personnel, contact: Seymour M. Farber, M.D., Assistant Dean, Dept. of Continuing Education in Medicine and Health Sciences, University of California Medical Center, Room 565-U, San Francisco 94122, MOntrose 4-3600, Ext. 179.

University of Southern California

September 15-December 11—**Emergency Management of the Acutely Ill Patient.** Los Angeles County Hospital. Tuesday evenings. 18 hours. $80.

September 16-December 21—**Diagnostic Interviewing of Families.** Los Angeles County Hospital. Wednesday afternoons. 24 hours. $35.

September 16-November 18—**Child Psychiatry—Unit I, The School Age Child.** Los Angeles County Hospital. Wednesday afternoons. 20 hours. $55.

September 16-December 2—**Psychiatric Case Conferences.** Los Angeles County Hospital. Wednesday afternoons. 20 hours. $25.

September 17-May 13—**Supervised Psychotherapy (Sec. 1).** Los Angeles County Hospital. Thursday afternoons. 128 hours. $75.

September 22-May 18—**Supervised Psychotherapy (Sec. 2).** Memorial Hospital of Long Beach. Tuesday afternoons. 128 hours. $75.

September 22-November 24—**Bedside Cardiology.** St. Vincent's Hospital. Tuesday evenings. 18 hours. $70.

September 23-December 9—**Elements of Practical Cardiology.** Wednesday evenings. 24 hours. $80.

September 24-December 17—**Bedside Clinics and Set Clinics in Internal Medicine.** Thursday evenings. 24 hours. $80.

October 18-November 9 — **Medical Centers of South America.** 36 hours. $210.

October 22-23—**Medical Surgical Gastroenterology Conference.** Ambassador Hotel, Los Angeles. Thursday-Friday. 14 hours. $45.

October 23-25—**Medical Aspects of Learning and Behavior.** Disneyland Hotel, Anaheim. Friday-Sunday. 22 hours. $15.

October 29—**Medicine—USC—1964.** Beverly Hilton Hotel, Beverly Hills. Thursday. 6 hours. $25.

November 4-11—**Pediatric Dermatology.** Los Angeles County Hospital. Wednesday. 14 hours. $25.

November 4-25—**Basic Funduscopy in Internal Medicine.** Los Angeles County Hospital. Wednesdays. 8 hours. $45.

November 11-January 13—**Recent Developments in Psychotherapy.** Wednesdays. 16 hours. $55.

December 2-February 17—**Psychosomatic Case Conferences.** Los Angeles County Hospital. Wednesdays. 20 hours. $25.

December 4-6—**Sociology and the Psysician—A Seminar.** Riviera Hotel, Palm Springs. Friday-Sunday. 9 hours. $35.

December 11-13—**Water and Electrolyte Balance.** El Mirador Hotel, Palm Springs. Friday-Sunday. 22 hours. $60.

January 6-March 10—**Psychosomatic Pediatric Case Conferences.** Children's Hospital. Wednesdays 8:00-10:00 p.m. 20 hours. $55.

January 8-10—**Adolescence.** El Mirador Hotel, Palm Springs. Friday-Sunday. 22 hours. $60.

January 21-22—**New and Old Antibiotics.** Los Angeles County Hospital. Thursday-Friday. 15 hours. $35.

January 29—**Nuclear Medicine.** Los Angeles County Hospital. Fridays, 4:00-5:00 p.m.

February 2-April 20—**Bedside Cardiology.** Los Angeles County Hospital. $80.†

February 12-14—**Spatial Electrocardiography.** El Mirador Hotel, Palm Springs. Friday-Sunday. 22 hours. $60.

February 19-21—**Neurological Procedures and Principles Useful in Internal Medicine.** Los Angeles County Hospital. Friday-Sunday. 22 hours. $65.

February 24—**Shock Symposium.** Statler Hilton Hotel, Los Angeles. Wednesday. 7 hours. $25.

February 25-26—**Pulmonary Disease.** Beverly Hilton Hotel, Beverly Hills. Thursday-Friday. 14 hours. $45.

Continuously—**Basic Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $100. Physicians may register at any time.

Continuously—**Advanced Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $85. Physicians may register at any time.

For course information contact: Phil R. Manning, M.D., Assoc. Dean, Postgraduate Division, USC School of Medicine, 2025 Zonal Ave., Los Angeles 90033, CApital 5-1511, Ext. 300.



The Physician's BOOKSHELF

HERNIA—Amos R. Koontz, A.B., B.S., A.M., M.D., D.Sc., (hon.), F.A.C.S., Surgeon to The Johns Hopkins Hospital; Consultant in Surgery to the Surgeon General of the United States Army; Emeritus Assistant Professor of Surgery, The Johns Hopkins University School of Medicine. Appleton-Century-Crofts, Inc., 35 West 32nd St., New York 1, N.Y., 1963. 227 pages, $11.95.

Dr. Koontz has devoted a lifetime to the study of problems of herniae and the results of his experience are well recorded in this monograph on hernia. The anatomy of various herniae is well described, the pathological physiology related to the mechanisms of occurrence and recurrence are soundly discussed, and the operative techniques are written in a comprehensible and straightforward manner so that they can be readily understood and easily practiced by the average general surgeon. This is a sound book on hernia, and is recommended for review by all those interested in this particular problem. It has not gone into detailed discussion of the latest concepts of properitoneal repair of hernia, and its contents are largely standard material on all types of hernia. It is worth reviewing this book, but hardly a required volume in the ordinary surgeon's library. It can be well reviewed in the hospital library or a medical library, and need not be available for ready reference on the shelf of the average surgeon.

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RADIATION MEDICINE—edited by A. I. Burnazyan and A. V. Lebedinskii. Translated by Harry Asher, B.A., Department of Physiology, University of Birmingham. Translation edited by Dame Janet Vaughan, Honorary Director, Medical Research Council, Bone-Seeking Isotopes Research Unit. A Pergamon Press Book distributed by The Macmillan Company pursuant to a special arrangement with Pergamon Press Limited, Oxford, England, 1964. 363 pages, $12.00.

This interesting monograph is written by some 11 authors and divided into 7 chapters. The first is devoted to physics and dose measurement, the second to some of the biological effects of radiation, the third to the pathology of radiation sickness, and the remaining chapters to such topics as infection and immunity in irradiated animals, toxicology of radioactive substances, delayed effects of radiation, diagnosis and treatment of radiation sickness, chemical protection against radiation and the pathologic anatomy of radiation damage.

The authors are dealing primarily with atomic radiation incident to war or peace-time accidents. They tend to emphasize functional alterations of the central nervous system as one of the basic and earliest changes following radiation injury. Support of this hypothesis is equivocal; that some functional change in the CNS may occur is of course agreed.

Excellent *animal* studies regarding time-dose response between and within species regarding "sensitivity" to radiation injury is presented in chapter three.

Whether the authors, translator, or translating editor, singly or in combination, are at fault for the numerous errors is not established. The preface states that this work "is intended for medical students in higher educational institutions and physicians interested in the increasing applications of radioactivity to medicine and biology." It is doubtful if the former would recognize these errors. Some, but not all, of the glaring transgressions include—(a) discussion of the physical properties of beta rays under the heading of alpha (p. 8, first paragraph), (b) "half life of radon equals 3823 days" (p. 22, paragraph 4) and, (c) "in the pulmonary artery there are regions of atelectasis and emphysema etc." Such mistakes tend to discredit the high level of scientific progress we are led to believe the Russians have attained.

This reviewer cannot refrain in closing by quoting, in its entirety, the last paragraph of page 34: "In capitalist countries the ruling circles try to hinder the peaceful application of nuclear energy in every way possible, and to utilize it as an atomic weapon. In our country where propaganda in favour of war is punishable by law and where the achievements of science serve the welfare of the people and are used in their interest, particular attention is paid to utilizing both atomic energy and modern achievements in science and engineering for peaceful purposes."

J. H. Heald, M.D.

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HAEMATOLOGICAL TECHNIQUE FOR MEDICAL LABORATORY TECHNICIANS AND MEDICAL STUDENTS—Third Edition—E. M. Darmady, M.A., M.D. (Camb.), F.R.C.P., Senior Pathologist, Portsmouth and Isle of Wight Area Pathological Service; formerly Assistant Pathologist, Salisbury General Infirmary and Wiltshire County Council; Pathological Specialist R.A.F.V.R.; Demonstrator of Pathology, St. Bartholomew's Hospital, London; and S. G. T. Davenport, F.I.M.L.T., formerly Chief Technician, Portsmouth and Isle of Wight Area Pathological Service. Grune & Stratton Inc., 381 Park Avenue South, New York 16, N.Y., 1963. 263 pages, with 4 color plates and 22 text figures, $5.00.

This book, which contains standard hematologic techniques and a modest amount of technique discussion and test theory, provides ample information for a student of laboratory technology. The technique discussion is adequate for the more advanced technologist but space limits the theory aspect, in most instances, to summary statements which serve as a good rapid review. As a technique book for day-to-day reference in performance of tests, it has the disadvantage of using more or less paragraph form for directions and is not as easily followed as other books of technique. The book is best recommended for laboratory technology students or as a review handbook for those in the laboratory field.

Thomas E. Wynn, M.D.

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DIAGNOSTIC LABORATORY HEMATOLOGY — Third Edition, Revised and Enlarged—George E. Cartwright, M.D., Professor of Medicine, College of Medicine, University of Utah, Salt Lake City, Utah. Grune & Stratton, Inc., 381 Park Avenue South, New York 16, N.Y., 1963. 339 pages, $8.75.

An easily followed direction book of hematologic technique that should be of greatest use to the busy technologist as a rapid procedure reference. There is a minimum of technique discussion and in some chapters a modest amount of theory to satisfy quick reference needs. A book of this type is of principal value for the up-to-date methods described and should be of value in any hematologic laboratory.

Thomas E. Wynn, M.D.

GASTROENTEROLOGY—Volume II, Second Edition—Henry L. Bockus, M.D., Emeritus Professor of Medicine, University of Pennsylvania Graduate School of Medicine; and Present and Former Colleagues at the University of Pennsylvania Graduate School of Medicine and School of Medicine. W. B. Saunders Company, Philadelphia and London, 1964. 1,241 pages, $28.00.

Volume II of the second edition of Bockus' "Gastroenterology" covers the small intestine, disorders of absorption and nutrition and anemia of gastrointestinal disorders, the colon and diseases of the peritoneum, mesentery, and omentum. Composed largely by pupils of Bockus the volume brings up to date the clinical discussion of diseases and disorders of these sections of the gastrointestinal tract. Of particular interest are the considerations of some of the modern techniques of investigating diseases of the small bowel such as biopsy, intubation, tests of absorption and malabsorption and lymphangiography. There are extensive and excellent discussions of the clinical phases of such commonly recognized entities as regional enteritis, intestinal obstruction (as viewed by the internist), chronic ulcerative colitis and benign and malignant tumors of the small and large intestine. Along with these are excellent chapters on "Functional Disorders of the Colon" including the diagnosis and management of constipation and on "The Malabsorption Syndromes." The discussions of protein losing enteropathies, Zollinger-Ellison syndrome and familial recurring polyserositis will bring the reader up to date on these recently recognized syndromes.

As in the case of Volume I the text has been prepared primarily for practicing physicians but surgeons, radiologists and even those primarily interested in the laboratory will find much of interest and value in the discussions as presented. The references are excellent and will enable the reader to know where to expand and get further detailed information.

The stature of Bockus' textbook on gastroenterology is enhanced by the appearance of Volume II and practicing physicians and medical students will long look to it as a standard reference work on the subject.

DWIGHT L. WILBUR, M.D.

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THE COMPLICATIONS OF MODERN MEDICAL PRACTICES—A Treatise on Iatrogenic Diseases—David M. Spain, M.D., Clinical Professor of Pathology, State University of New York, Downstate Medical Center; Pathologist, Beth-El Hospital, Brooklyn, New York; Formerly, Director of Department of Laboratories and Research and Medical Examiner of Westchester County, New York; Formerly Associate Professor of Pathology, College of Physicians and Surgeons, Columbia University, New York. Grune & Stratton, Inc., 381 Park Avenue South, New York 16, N.Y., 1963. 342 pages, $12.75.

The magnitude of the field of iatrogenic disease is illustrated by the fact that the number of articles on the subject has doubled during the past ten years. With the exception of surgical excision, almost all types of specific treatment of cancer are also capable of inducing cancer under appropriate conditions. The antimicrobial agents can even, while curing infection, provide the opportunity for new infections to develop. Corticosteroids may precipitate new manifestations of the various diseases that are used to alleviate.

The hazards of practicing medicine in the present day are such that the contents of The Complications of Modern Medical Practices must be in our awareness constantly. Dr. Spain has done a great service to doctors by encompassing as much as he has between the covers of a single book. At the same time he confronts us with a choice akin to that of Hamlet: "To treat or not to treat: that is the question."

Another paraphrase from Hamlet seems appropriate as the author himself discusses this book. He states that "it is not intended to support or encourage any concept of therapeutic nihilism. It is also not intended as an encyclopedia of drug reactions. It is certainly not intended as a compilation of mistakes, accidents or errors in judgment. Finally, it is not concerned with the abuses of self-medications." This reviewer thinks the author doth protest too much. What is it about? "One of the purposes is to present a conceptual view of the broad spectrum of complications that result from the use of acceptable diagnostic and therapeutic procedures. In this sense, it is hoped that the actual and potential good of these powerful modern medical weapons currently available will be enhanced by increasing the physician's awareness of the many dangers, pitfalls and complications inherent in this arsenal."

Allowing for the differences in the critique of a pathologist versus that of a biologist, one may compare Dr. Spain's book with Rachel Carson's *Silent Spring*. They both tell of the dangers created by the use of man-made cures—in the one case dealing with the tremendous harmful potential of agricultural chemicals, in the other with the myriad large and small complications which the therapist himself may produce. No matter how promising or how carefully conceived, the chance of a reaction is always present.

While giving this book general praise, the reviewer notes that proofreading errors are fairly numerous and that some subjects are skipped over lightly. For example, the only reference to atabrine is the renal tubular damage which it may cause, similar to mercury toxicity.

Dr. Spain poses one moral beyond the obvious ones, which all of us would do well to observe: Whenever possible the diagnosis should be made first; only then, and after the natural history of the disease condition is considered in all its possible aspects, are the more powerful agents of treatment justified.

EDGAR WAYBURN, M.D.

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GENETICS TODAY—Volume I, Abstracts—Proceedings of the XI International Congress of Genetics, The Hague, The Netherlands, September 1963—Edited by S. J. Geerts, in collaboration with J. H. F. V. Abeelen, G. J. P. A. Anders, G. A. Van Arkel, J. A. Beardmore, F. Bianchi, J. M. Van Brink, H. J. Gloor, W. K. Hirschfeld, P. H. W. Van Der Kroon, J. H. Van De Pol, R. Prakken, F. H. Sobels, C. Stumm, J. H. Van Der Veen. A. Pergamon Press Book distributed by The Macmillan Company, New York, pursuant to a special arrangement with Pergamon Press Limited, 1963. 332 pages, $15.00.

This volume, one of three covering the latest International Congress of Genetics, contains the abstracts of contributed papers, demonstrations and films presented at the conference. The usefulness of the book for the average American reader has been increased by using English throughout. A wide range of topics concerned with many different organisms is covered in the abstracts which have been assembled into 18 sections. This breakdown into areas of special interest is most helpful because a subject index is not included, although an author index is presented at the end of the book. Out of a total of 885 abstracts only 147 are concerned with man. However, these have been made more readily available by collecting them into three sections entitled: Human Genetics (84); Human Cytogenetics (47); and Dermatoglyphics (16). Although only a small proportion is directly concerned with clinical medicine, the reader with an interest in human genetics is presented with a brief summary of worldwide activity in the rapidly expanding areas of genetical research in man. There is considerable variation in the information content of the abstracts and only a few give pertinent references. However, many of these abstracts have already been expanded into full length papers and published in various appropriate journals. The great diversity of subjects in the Human Genetics section is

reflected in the following areas of interest covered in the abstracts: Evolution, genetic polymorphisms, sperm preservation, sex ratio, genetic linkage, longevity, teratology, mental deficiency, deafness, neoplasia, immunology and new clinical syndromes. Although the Human Cytogenetics section contains fewer abstracts, there is also a considerable variety of interests presented: Chromosomes in evolution, meiotic chromosomes, pachytene chromosomes, chromosome distribution in the metaphase plate, DNA content of cells, autoradiography, effect of various agents (radiation, virus, heat shock, antimetabolites) on chromosomes, immunological properties of lymphocytes and association of chromosome anomalies with clinical syndromes. The renewed interest in dermatoglyphics (fingerprint studies) can probably be attributed to alterations which can be correlated with chromosome anomalies and possibly other genetic diseases. The abstracts in this section pursue this area further and cover techniques and population studies as well.

ROBERT S. SPARKES, M.D.

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THE PEDIATRIC PATIENT 1964—Coordinating Editor: Sarah R. Gustafson, Ph.D., Director, Department of Medical Literature, Hoffmann-La Roche Inc., Nutley, New Jersey; and Consulting Editor: David Baird Coursin, M.D., F.A.A.P., Director of Research, Research Institute, St. Joseph's Hospital, Lancaster, Pennsylvania. J. B. Lippincott Company, Philadelphia, Pa., 1964. 160 pages, $4.50.

This slim volume is the second of a series prepared by Drs. Sarah Gustafson and David Coursin. In addition to being sold, these volumes are widely distributed among physicians by the sales representatives of Hoffman-La Roche.

The editors have selected the fields in which the greatest advances have occurred. Their opening chapter, "Chromosomal Errors in Disease," reviews developments of the past few years with respect to chromosome culture and analysis and ends with a brief note on genetic counseling. Other chapters deal with gastrointestinal disorders, mental and emotional disorders, convulsive seizures, a variety of urinary tract diseases and collagen diseases. A chapter on viruses and vaccines covers the present status of oral poliomyelitis and measles vaccines, and the progress in some respiratory diseases, rubella and trachoma.

This little book can be perused quickly and provides the busy pediatrician with a rapid although rather superficial review of these topics. For those who wish to delve into the subject further, ample references are provided. It is regrettable, however, that many of the references are from medical news media (*Medical Tribune* or *Medical World News*) or from papers or scientific exhibits from various meetings where the source is not readily available.

MOSES GROSSMAN, M.D.

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FUNDAMENTALS OF OTOLARYNGOLOGY—A Textbook of Ear, Nose and Throat Disease—Fourth Edition, Illustrated—Lawrence R. Boies, M.A., M.D., Professor of Otolaryngology, Chairman, Department of Otolaryngology; Jerome A. Hilger, M.D., M.S., Clinical Professor of Otolaryngology; and Robert E. Priest, M.D., M.S., Clinical Professor of Otolaryngology, all of the University of Minnesota Medical School. W. B. Saunders Company, Philadelphia and London, 1964. 553 pages, $8.50.

The fourth edition of Fundamentals of Otolaryngology by Boies, Hilger and Priest is a revised version of the third edition of Boies' book by the same name. The other authors, who were important contributors to the previous editions, have deservedly been elevated to higher status.

Since publication of the first edition of this text, it has generally been regarded as one of the outstanding texts for the teaching of otolaryngology to undergraduate medical students. The fourth edition contains a large number of revisions in the text, illustrations and bibliography which do not alter the basic structure or content of the work, but enhance its desirability for student use. The book is highly recommended as being concise, comprehensive, well-organized, readable, and authoritative.

CHARLES P. LEBO, M.D.

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OCULAR AND ADNEXAL TUMORS—New and Controversial Aspects—Symposium sponsored by Department of Ophthalmology, Baylor University College of Medicine. Milton Boniuk, M.D., Editor, Assistant Professor of Ophthalmology and Chief, Sections of Ophthalmic Pathology and Ocular Oncology, Baylor University College of Medicine, Houston, Texas. The C. V. Mosby Company, St. Louis, Mo., 1964. 511 pages, with 363 figures and 4 color plates, $25.00.

The sub-title of this book "New and Controversial Aspects" of the subject "Ocular and Adnexal Tumors" is very apropos.

The spirited discussion at the end of each section constitutes a rich and rewarding insight into different viewpoints governing management problems. The initial moderator, Dr. Maumenee, sets the pace by purposely bringing out divergent views. The following quote (page 360) typifies the discussion: "I think this is a most interesting discussion, and it's being carried on by people of great authority in this field. Therefore, when this work is published, it will attract a great deal of attention by ophthalmologists throughout the country and the world. I must say, because I have slightly different feelings about some of the material that has been presented, that I would like to present very briefly the other side of the case."

The color photographs are superb, as are the very numerous black and white illustrations and photographs. One has the feeling of actually being present at the symposium and has an opportunity to review the slides and discussion.

This text updates the subject matter covered in a magnificent fashion. It is to be highly recommended for ophthalmologists and pathologists.

ARTHUR JAMPOLSKY, M.D.

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PRACTICAL HAEMATOLOGY—Third Edition—J. V. Dacie, M.D. (Lond.), F.R.C.P. (Lond.), Professor of Haematology, Postgraduate Medical School of London; and S. M. Lewis, B.Sc., M.D. (Cape Town), D.C.P. (Lond.), Lecturer in Haematology, Postgraduate Medical School of London. Grune & Stratton, Inc., 381 Park Avenue South, New York 16, N.Y., 1964. 435 pages, $7.50.

The authors state their aim is "to present as fully but as concisely as we can the whole range of laboratory work which may at the present time have to be undertaken in the investigation of a patient suffering from a blood disease," and have done it admirably. This is a book concerning itself primarily with laboratory hematology, and all aspects are covered including a new chapter on radioisotopes. Laboratory methods are detailed and the longest chapter deals with the investigation of hemolytic anemias, a subject with which Doctor Dacie's name has long been associated. Lengthy treatment is given to blood groups and transfusions, also to the investigation of hemorrhagic disorders. The authors apologize for their treatment of morphologic hematology, but the few pages of description and the photomicrographs of red cell abnormalities are worth the price of the book. There is little on bone marrow morphology but the section on bone marrow examination otherwise is excellent. This book will be of most value to hematologists, and laboratory workers in clinical and investigative hematology but of value to the internist and other physicians for an understanding of the laboratory aspects of hematology. It is highly recommended.

WILLIAM F. LUTTGENS, M.D.

THE LUNG AND ITS DISORDERS IN THE NEWBORN INFANT—Volume I in the Series: Major Problems in Clinical Pediatrics—Mary Ellen Avery, A.B., M.D., Assistant Professor of Pediatrics, Johns Hopkins University School of Medicine; Pediatrician-in-Charge, Newborn Nurseries, The Johns Hopkins Hospital. Consulting Editor, Alexander J. Schaffer. W. B. Saunders Company, Philadelphia and London, 1964. 224 pages. $7.50.

Dr. Mary Ellen Avery, author of this book, is Assistant Professor of Pediatrics at Johns Hopkins University School of Medicine, and Pediatrician-in-Charge of the Newborn Nurseries at the Johns Hopkins Hospital. This book is the first in a series, "Major Problems in Clinical Pediatrics," under the editorship of Dr. Alexander J. Schaffer. Dr. Schaffer could hardly have chosen a better or more qualified person for the subject at hand than Dr. Avery. Through her efforts, this series has had a most auspicious beginning.

In her usual meticulous and clear manner, Dr. Avery has done a superb job of reviewing a difficult subject, and making it come alive.

In Part I, she describes the normal development and physiology of the fetal and neonatal lung. In Part II, Disorders of Respiration in the Newborn Period are discussed, and Part III is devoted to artificial respiration. The reviewer is pleased to see the return of the terminology "Hyaline Membrane Disease," for lack of a better term. Since this entity is so very important in the newborn period, it is well to quote Dr. Avery's conclusions after one of her typically fine chapters:

"The preceding sections make evident the contradictions that face the clinician who wants to treat an infant with Hyaline Membrane Disease. If he subscribes to the aspiration theory, he will want to keep the infant head down; if he believes heart failure is a problem, he may raise the head. If he is concerned with the possibility of a decreased blood volume from early clamping of the cord, he will elect to transfuse the infant, just as he might if he felt clinical shock were important. If he believes the trouble is heart failure, he would probably restrict salt, and surely not transfuse and give albumin. He may feel that the degree of cyanosis warrants whatever added inspired oxygen is needed to overcome it. He may, on the other hand, be impressed that high oxygen is toxic to animal lungs, and perhaps infant lungs. If a metabolic acidosis troubles him, he may alkalinize the infant, at the risk again of overloading the circulation already disordered. He may feel that artificial respiration is in order, although he knows the risks involved in the face of shock."

This is a book with which every pediatrician must be familiar, and to which everyone who deals with newborn infants should have ready access. Doctors Avery and Schaffer have made a most worthwhile contribution in a much-needed area.

BENJAMIN M. KAGAN, M.D.

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GROWTH DISORDERS IN CHILDREN AND ADOLESCENTS—Solomon A. Kaplan, M.D., Associate Professor of Pediatrics, University of Southern California; Head, Division of Endocrinology, Childrens Hospital of Los Angeles; Director of Laboratories, Childrens Hospital of Los Angeles; and Attending Physician, Los Angeles County Hospital, Los Angeles, California. Charles C. Thomas, Publisher, 301-327 East Lawrence Avenue, Springfield, Illinois, 1964. 202 pages, $8.50.

The author has succeeded in describing what may be expected to occur in the development of children and adolescents whose growth patterns, medical histories, and physical examinations indicate growth disorders. In doing so, he has defined in some detail the current concepts of "Normal Physical Growth." He describes variations in the developmental pattern of secondary sexual characteristics, and the influence of growth hormones, thyroid, the gonads, and the adrenals. Primordial dwarfism, the effect of renal and heart disease, psychological and mental factors are expertly reviewed. A chapter is devoted to the clinical examination of subjects with such problems, and there are chapters on "Treatment of Growth Retardation," and on "Excessive Growth in Children."

No attempt has been made to give an exhaustive review of the literature, but references are adequate for those who seek additional information. There are 18 pages of references.

This is a book that not only lends itself to ready reference, but one which can be read with pleasure as well as profit. Dr. Kaplan writes with obvious facility and clarity, as well as meticulous attention to accuracy.

The photographs are of excellent quality. There are 56 figures, which number includes the charts. All of these are pertinently related to the text. This book can be recommended for the pediatrician, and for any physician concerned with problems of growth in children and adolescents.

BENJAMIN M. KAGAN, M.D.

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THE CORONARY PATIENT—Hospital Care and Rehabilitation—Gladys Nite, M.A., R.N., Principal Investigator and Director, Research in Nursing, Community Studies, Inc., Kansas City, Missouri; and Frank N. Willis, Jr. Ph.D., Co-Investigator and Research Associate, Community Studies, Inc., Kansas City, Missouri. The Macmillan Company, New York, and Collier-Macmillan Limited, London, 1964. 418 pages, $12.50.

This book reports a four-year study carried out in the Independence Hospital of Independence, Missouri, of nursing care of approximately 70 hospitalized patients with acute myocardial infarction. The authors have worked out an elaborate mechanism to determine the effect of especially trained nursing personnel on the recovery and comfort of the patient, especially when the nurse carries the same load as other nurses customarily used in the same hospital.

The authors have planned the work with great care and have set up criteria to evaluate the quality of care and the identification and description of the nursing problems that occurred. It is apparent from the protocols that the experimental group of patients treated by the nurses who had been particularly instructed in the care of cardiac patients received superb attention. In general, these patients seem to have profited considerably from the detail of nursing care that they received, but the data indicated no increased survival or decreased complications.

The book is somewhat repetitive and the degree of detail may be excessive, but the authors have tried to tabulate a wide variety of factors involved in the course of the four weeks' hospitalization that each patient had.

It is apparent that the principal investigator considered that the nurse was an independent member of the medical team, as exemplified by the fact that she ordered leg exercises even though the physician did not order them. She did this because her review of the literature indicated this was wise and because many physicians in the same hospital ordered this. The customary nursing group viewed their role in a somewhat more limited fashion and felt their role was to carry out orders written by the physician.

Much of the details of nursing care will be of great value to physicians, and the suggestions by the authors of means of diversion, of the value of explaining why activities were to be limited, of appreciating that not all patients relax with classical music but that some prefer jazz, and the recommendations regarding foam rubber mattresses, contour sheets, nylon protective covers over the mattresses instead of rubber covers, etc., all are recommendations of practical value. Each chapter has a selected bibliography and at the end of the book there is an annotated bibliography, pri-

marily dealing with various aspects of cardiac and coronary disease, which will be of considerable value to the reader.

The book will be of considerable interest to nurses and to those physicians who wish to understand more about how first-class nursing care can be given to patients if the nurses are instructed in the proper philosophy and roles of her mission.

MAURICE SOKOLOW, M.D.

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OUTLINE OF ELECTROCARDIOGRAPHY—H. Harold Friedman, M.D., F.A.C.P., F.A.C.C., Assistant Clinical Professor of Medicine, University of Colorado Medical Center; Attending Physician and Electrocardiographer, General Rose Memorial Hospital, Denver; Attending Cardiologist, National Jewish Hospital and Veterans Administration Hospital, Denver. McGraw-Hill Book Company, Inc., (The Blakiston Division) 330 West 42nd Street, New York, N.Y. 10036, 1963. 300 pages, $5.95.

In this outline the author endeavors to present the basic concepts of electrocardiography and the fundamentals of electrocardiographic diagnosis. This well-bound, easy-to-read, soft-covered handbook is divided into twenty-four chapters which are superbly organized and written with succinct clarity. The scope is quite comprehensive and the material presented is simplified. Several sections may appear rather dogmatic to some readers but this is almost unavoidable in any outline format. However, the diagnostic criteria listed in the text represent a consensus of authoritative electrocardiographers. In addition, the reader is provided with a splendid supplemental reference bibliography relating to the appropriate research and clinical data.

Numerous diagrams and illustrative electrocardiograms are utilized to complement and amplify the author's superimposed brevity. Dr. Friedman devotes some attention to the analysis of the electrocardiogram by the spatial vector as described by Dr. Robert P. Grant, and he also includes a few remarks on basic considerations in vectorcardiography. Included in the Appendix are numerous reference tables relating to the routinely measured intervals and amplitudes. The index is accurate and reasonably detailed.

This outline ranks high on the list of the many similar books on the market today. It is especially recommended for medical students and house officers, as well as the practicing physician who wishes to review the fundamentals of electrocardiography.

MORTON ROSENBLUM, M.D.

* * *

ATLAS OF BLOOD CYTOLOGY—Cytomorphology, Cytochemistry and Cytogenetics—G. Forteza Bover, M.D., with the collaboration of R. Baguena Candela, M.D. Translated by F. G. Golton, J. Vinas and J. Triginer; preface by William Dameshek, M.D. Distributed in the U.S.A. by Grune & Stratton, Inc., New York, 1964. 511 pages, $39.50.

This beautiful book was printed in Spain with over 150 plates, each with two or more photomicrographs in color (×1200), of large size and with brief accompanying description. The translation is excellent and there are no problems with terminology.

The book is divided into three parts, including details of staining methods, normal and pathologic cells. Much emphasis has been placed on cytochemical staining and illustrations of various stains along with fluorescent and phase microscopy are presented with the May-Grunwald-Giemsa stain. One finds it difficult to agree with the author at the present time that the classical staining methods have been "largely superseded" by these newer techniques. However the presentation of this material is probably the most unique and valuable aspect of the book.

The quality of reproduction is excellent except for a few plates. Fine details of cytoplasmic granulation and nuclear chromatin can be distinguished. The color is generally faithfully reproduced although the eosinophilic granules of Plate I are not eosinophilic as are those of eosinophils illustrated elsewhere. The pictures of infectious mononucleosis are among the poorest.

Blood, bone marrow and lymph node material of all varieties are included. There are good plates of tumor cells, parasites, chromosome abnormalities, and of disorders of the lymph nodes and reticulohistiocytic system. No illustrations of osteoblasts were found.

In the copy reviewed, ten pages were out of place and the descriptions did not face the plate. Plate XLII, Hypochromic Iron Deficiency Anemia, illustrates no hypochromia or any features that would permit diagnosis from the picture. In Plate XVL, the lower picture is probably upside down because the descriptive text and illustration don't correspond, but it is difficult to be sure what is wrong. This demonstrates the problem with all current atlases for ideally there should be no problem in simple identification of cells or disorders from the picture.

Medical libraries will include this atlas in their hematology collections, but its cost will force most students to use the more reasonable Diggs or Sandoz atlases. The practicality of cytochemical stains and other special methodology remains to be seen. The definitive atlas of hematology has not yet appeared.

WILLIAM F. LUTTGENS, M.D.

* * *

THE ATRIOVENTRICULAR NODE—And Selected Cardiac Arrhythmias—David Scherf, M.D., F.A.C.P., Professor of Clinical Medicine, New York Medical College; and Jules Cohen, M.D., F.A.C.P., Associate Professor of Clinical Medicine, New York Medical College. Grune & Stratton, Inc., 381 Park Avenue South, New York, N.Y., 1964. 466 pages, $18.75.

This monograph, as the preface states, is a series of loosely connected essays dealing with selected disturbances of the cardiac rhythm involving the atrioventricular node. It is really a review of the literature with a few comments regarding the authors' position on some of the atrioventricular nodal problems under discussion. The review is complete and scholarly and each chapter has a fairly complete bibliography beginning with the earliest work on the subject. Because of the authors' European background, French and German references form a substantial portion of the bibliography. This is of great value to the American reader because a good deal of the early work published in these foreign languages is available for review.

The contents of the monograph form a fairly comprehensive discussion of the atrioventricular node, its anatomy and physiology, and a differential diagnosis of all varieties of atrioventricular rhythm. Included also are atrioventricular block, return extrasystoles, atrioventricular dissociation bloc, return extrasystoles, atrioventricular nodal parasystole, and pre-excitation syndrome. The chapters dealing with atrioventricular dissociation, pre-excitation syndrome, and atrioventricular rhythm are particularly comprehensive and well illustrated.

Even though the authors state that the section on treatment of the discussed arrhythmias "purposely was kept as sketchy as possible," the clinician will indeed regret that not only is treatment scarcely mentioned but neither are the clinical implications of the disturbances of rhythm under discussion. For example, under atrioventricular dissociation a very short paragraph indicates that digitalis plays an important role, but this is confined to indicating what percentage of patients with the arrhythmia was probably due to digitalis. No discussion of the difficulties in establishing digitalis toxicity, its relationship to atrial tachy-

cardia with 2:1 conduction, premature beats, etc. was discussed.

The book will appeal to those who are interested in the historical development of arrhythmias and conduction disturbances involving the atrioventricular node, but will be of limited value to clinicians who desire a greater clinical approach.

MAURICE SOKOLOW, M.D.

* * *

MYTHS OF MADNESS—New Facts for Old Fallacies—Don D. Jackson, M.D. The Macmillan Company, New York, 1964. 178 pages, $4.50.

"Myths of Madness" appears to have been written by Doctor Jackson primarily for the public that has most certainly been confused by the barrage of misleading scientific information which is designed to explain why people have emotional or mental difficulties. Dr. Jackson emphasizes such things as "very, very few people are born crazy" and that few of them are diagnosed by the laboratory tests which are so traditional for physical disorders. He reviews some of the work that is being done in the Behavioral Sciences and emphasizes the impact of culture, environment, and in particular, the family.

Along with other books which are written for public consumption, there are some over simplifications which are in the service of making a point. Most physicians would find the book elementary but if they were familiar with its contents they might have occasion to recommend the book to some of their patients who wanted "something authoritative" to relieve their anxieties.

NORMAN Q. BRILL, M.D.

* * *

ANXIETY AND TENSION CONTROL—A Physiologic Approach — Edmund Jacobson, M.D., LL.D., Ph.D., F.A.C.P., Director, Laboratory for Clinical Physiology, Chicago, and the Jacobson Clinic; formerly Research Associate, Assistant Professor of Physiology (1926-1936), University of Chicago; formerly Associate Attending Physician (Medicine), Michael Reese Hospital. J. B. Lippincott Company, East Washington Square, Philadelphia 5, Pa., 1964. 216 pages, plus 32 pages of a manual—Self-Operations Control, $9.00.

Dr. Jacobson's new book, by his own admission, is an attempt to modernize his well-known work "Progressive Relaxation" published originally in 1929 and revised in 1938. The "modernization" has consisted of an effort to gild the same hypotheses and contentions with a coating of pseudo-scientific jargon from medical electronics. The dust cover claims that the book "demonstrates how you can help your patients minimize their tensions," and, as noted, Dr. Jacobson describes this as a "physiological approach." Also, the method is "workable," "based on years of laboratory investigation," and "is a simple self-help technique for both patient and physician." It refers to Dr. Jacobson's description as being "in language that is at all times clear and direct." Beneath the dust cover one finds language which is vague and ambiguous. The objectivity referred to seems appallingly absent. For example, in a bibliography on electrical measurement of nervous and muscular states, the author quotes 9 references of his own, ignoring all other investigators, including such sound basic work as that by Duffy and Malmo.

There are three parts to the book. An introductory section which attempts to offer a rationale for a technique of muscular relaxation which, according to the author, should cure all ills both of patient and physician. The second section is a straightforward, clearly written, well illustrated description of Dr. Jacobson's technique of "anxiety and tension control." The third section is a group of brief case reports which are noteworthy for their lack of objectivity and precision. They attempt to serve the purpose, I assume, of substantiating the author's claim for the effectiveness of his technique. In this effort, also, the author falls far short of his goals.

Dr. Jacobson's technique of muscular relaxation is essentially an interesting attempt to deal with the problem of anxious and tense patients. Clearly, any contribution to the solution of their problems would be welcome. Unfortunately, the book does not offer the physician or patient much that is tangible, scientific, or convincing.

JOSHUA S. GOLDEN, M.D.

* * *

FUNDAMENTAL AIDS IN ROENTGEN DIAGNOSIS —Emphasizing Spot Filming and Fluoroscopy—Charles B. Storch, M.D., Associate Clinical Professor, New York University—Cineradiology, Radiology, Cleft Palate Research; Director, Radiology Department, Lefferts General Hospital, Brooklyn, N.Y.; Associate Attending Radiologist, Brookdale Medical Center, Brooklyn, N.Y. Grune & Stratton, Inc., New York and London, 1964. 370 pages, $14.75.

This book fulfills a need in offering an organized introduction to fluoroscopy, spot filming, and general radiologic examination of the chest and abdomen. It is well written and illustrated. It is quite logically organized and its table of contents and bibliography are fairly comprehensive. If the book is evaluated only for what it is meant to be—an introduction into the art of fluoroscopy for a beginner, it is fulfilling its function admirably. It is not to be taken, however, as a text from which to study disease or gather information about it. The book does have many voids and a few misleading generalizations about diagnostic signs of congenital heart disease for instance that are understandable in the context of the first introduction, but are not to form the basis for studying congenital heart disease for instance after the initiation is completed.

Some objections and criticisms can be raised that the book does not provide enough information and guidance about the use of image intensified fluoroscopy or cineradiography. As these tools are more and more widely used and are part of the radiologic examination of the areas covered by this book, more mention and more coverage would have been advantageous. A further criticism may be that many readers may find it somewhat offensive and disappointing to have much of the material organized as questions and answers, somewhat reminiscent of grade school. Staging some examinations, as for instance the fluoroscopic examinations of the heart and stomach, into stages and positions by numbers may also be a rigid approach that even modern cookbooks attempt to avoid.

In spite of these shortcomings, the book has a function and is a good introduction to fluoroscopy.

ALEXANDER R. MARGULIS, M.D.

* * *

TEXTBOOK OF UROLOGY—Second Edition—Victor F. Marshall, M.D., F.A.C.S., Clinical Professor of Surgery (Urology), Cornell University Medical College; Attending Surgeon-in-Charge, Urology, James Buchanan Brady Foundation of The New York Hospital; and Associate Attending Urologist, The Memorial Sloan-Kettering Center for Cancer, New York City. Hoeber Medical Division, Harper & Row, Publishers, Inc., New York, Evanston, and London, 1964. 355 pages, $8.50.

This new, bright edition of Marshall's classic text will be welcomed by medical students and physicians alike as an authoritative source of all that is important in the field of urology. The chapter on urinary infections in children is particularly timely.

The whole book is well illustrated and readable, and well worth the money.

X-RAY TECHNOLOGY—Third Edition—Charles A. Jacobi, B.Sc., R.T. (A.R.R.T.), Assistant Professor, Medical X-Ray Technology, and Radiation Health and Safety Officer, Radioactive Byproduct Installations, Oregon Technical Institute, Klamath Falls, Oregon; and Don Q. Parris, R.T. (A.R.R.T.), Chairman, Medical X-Ray Technology, Oregon Technical Institute, Klamath Falls, Oregon. The C. V. Mosby Company, Saint Louis, Missouri, 1964. 452 pages, $11.50.

In this new edition the authors have replaced most of the x-ray illustrations with new cuts of much better quality. The illustrations of patient-positions taken from Merrill's 1959 folio have been entirely replaced. There have been a few new projections added, but this volume actually includes only the routine examinations. The former sections on dental radiography and hip nailing are omitted—otherwise the format is essentially unchanged from the second edition.

The technical procedures are all explained and illustrated in great detail. Pertinent points in anatomy and physiology are reviewed in relationship to the part examined. Radiographic physics and the principles of technique are well covered.

The section on contrast media is quite outdated. The use of flash identification, automatic processors and polaroid film techniques are not discussed. Aseptic technique should be part of the training of every technician.

However, this book fulfills its purpose which is to cover the basic technical procedures in a practical and concise manner. It was written for students of x-ray technology at the Oregon Technical Institute.

M. E. Mottram, M.D.

* * *

HUMAN LABOR AND BIRTH—Harry Oxorn, B.A., M.D., C.M., F.A.C.S., F.R.C.S.(C), Lecturer in Obstetrics and Gynecology, McGill University; Associate Obstetrician and Gynecologist, Royal Victoria Montreal Maternity Hospital, Montreal, Canada; and William R. Foote, B.A., M.D., C.M., F.A.C.S., F.R.C.O.G., F.R.C.S. (C), Associate Professor of Obstetrics and Gynecology, McGill University; Obstetrician and Gynecologist, Royal Victoria Montreal Maternity Hospital, Montreal, Canada. Appleton-Century-Crofts (A Division of Meredith Publishing Company), New York, 1964. 485 pages, $7.95 (Paperbound).

This book might be described as an expanded synopsis of that portion of obstetrics dealing with what its authors call "the mundane topic of the passage of the fetus through the pelvis." It is aimed very largely at the undergraduate medical student and is designed to obviate didactic lectures and needless note-taking about the mechanisms of normal and abnormal labor. In addition to the usual descriptions of all the standard obstetric mechanisms, there are chapters on pelvic anatomy, fetal head anatomy, radiography in obstetrics, analgesia and anesthesia, as well as asphyxia and injuries of the newborn.

The outline style of presentation predominates in the text material and there are numerous simple but excellent line drawings, most of them prepared expressly for this volume by Dorothy Irwin. The illustrations of forceps operations by Elizabeth Broedel are borrowed from Douglas and Stromme's fine atlas on operative obstetrics. The fact that text and related drawings face each other accounts for the rather large number of pages (almost five hundred) in the book; many pages are sparsely filled with printed words and the illustrations are by no means crowded, but these thoughtful arrangements are a real asset.

This book is excellent for the purpose intended by its authors and may be recommended to students and house officers caring for women in labor. A copy should be available in every labor-delivery suite to complement the larger standard textbooks and to compete with the ubiquitous television set for the attention of the intern or resident on duty.

C. E. McLennan, M.D.

* * *

ADVANCES IN DIAGNOSTIC UROLOGY—Edited by Joseph J. Kaufman, M.D., F.A.C.S., Associate Professor of Surgery/Urology, School of Medicine, University of California at Los Angeles. With 14 Contributing Authors. Little, Brown and Company, Boston, Mass., 1964. 294 pages, $12.50.

Urology is so technical a specialty and urologic technics are advancing so rapidly that Dr. Kaufman has done the specialty a real service by assembling concise, well-illustrated chapters by 14 authorities who have themselves taken part in the development of these technics. Much of the detailed material can be found nowhere else, and is in a form readily usable by urologists in practice.

* * *

CARDIAC ARREST AND RESUSCITATION—Second Edition—Hugh E. Stephenson, Jr., B.S., M.D., F.A.C.S., Professor of Surgery, University of Missouri School of Medicine, Columbia, Mo. The C. V. Mosby Company, Saint Louis, 1964. 501 pages, $15.00.

This is a compilation of a large literature on the subject of cardiac arrest and resuscitation. There is no comprehensive account of the author's personal experiences. The author has enlisted the contributions of ten contributors who, instead of writing individual chapters, write sections within chapters so that it is sometimes difficult to determine the authorship of any particular part.

This style is somewhat difficult because of the frequent large capitalization. There was some duplication, as for example, one chapter describes complications in cardiac resuscitation and five chapters later there is one on cerebral anoxia and neurologic sequelae after cardiac arrest.

The material is somewhat elusive because it appears to have been written as a review of the literature rather than a comprehensive account of present opinion.

The material covered is quite complete and includes the mechanism, diagnosis, management, prevention of cardiac arrest, post-resuscitative care, complications, prognosis, and elective cardiac arrest. There is also a good account of the medico-legal aspects with a summary of cases which have been subject to litigation.

Details of some of the newer equipment for monitoring and for pacing are included in the chapter on management of cardiac arrest.

The literature is most comprehensive and consists of 45 pages of references, two columns to the page.

The book is valuable for the review of this extensive bibliography, but one hopes that in the next edition the authors describe their own experiences and critical judgments.

Maurice Sokolow, M.D.

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1. Roach, T. C.: Therapy of Peptic Ulcer, J. Louisiana Med. Soc. *115*:136-139 (April) 1963.
2. Steinberg, H., and Almy, T. P., Drugs for Gastrointestinal Disturbances, Chapter 21, in Modell, W. (editor): Drugs of Choice —1964-1965, St. Louis, The C. V. Mosby Company, 1964, p. 343.

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BOOKS RECEIVED

Books received by CALIFORNIA MEDICINE *are acknowledged in this column. Selections will be made for more extensive review in the interest of readers as space permits.*

ACID-BASE STATUS OF THE BLOOD—Second Edition — Ole Siggaard-Andersen. The Williams Company, Baltimore, 1964, exclusive U.S. agents. 134 pages, $6.50.

ADVANCES IN BIOLOGY OF SKIN — Vol. 5 — Wound Healing—Edited by William Montagna, University of Oregon Medical School, Portland, Oregon; Oregon Regional Primate Research Center, Beaverton, Ore.; and Rupert E. Billingham, Department of Anatomy, The Wistar Institute, Philadelphia, Pa. (Proceedings of the Brown University Symposium on the Biology of the Skin, 1963. A Pergamon Press Book, distributed by The Macmillan Company, New York, 1964. 254 pages, $15.00.

AGORAPHOBIA IN THE LIGHT OF EGO PSYCOLOGY—Edoardo Weiss, M.D. Grune & Stratton, Inc., New York and London, 1964. 132 pages, $5.50.

THE BIOCHEMISTRY OF POLIOMYELITIS VIRUSES —A Synopsis of Poliomyelitis Infection and Research—by Ernest Kovacs, former Research Fellow, University of Toronto. A Pergamon Press Book, distributed by The Macmillan Company, New York, 1964. 269 pages, $10.00.

THE BIOLOGY OF MIND—W. R. Hess, M.D. (Translated by Gerhardt Von Bonin, M.D.) The University of Chicago Press, Chicago and London, 1964. 203 pages, $6.00.

BRAIN FUNCTION—Proceedings of the First Conference, 1961—Cortical Excitability and Steady Potentials, Relations of Basic Research to Space Biology. Sponsored by the Brain Research Institute, University of California, Los Angeles, in collaboration with the American Institute of Biological Sciences and with the support of the U.S. Air Force Systems Command. Mary A. B. Brazier, Editor. UCLA Forum in Medical Sciences: Number 1. University of California Press, Berkeley and Los Angeles, 1963. (Publication date—1964) 394 pages, $10.00.

CLINICAL TOXICOLOGY—Fourth Edition—Clinton H. Thienes, M.D., Ph.D., F.A.C.P., Emeritus Director, Institute of Medical Research, Collis P. and Howard Huntington Memorial Hospital, Pasadena; Emeritus Adjunct Professor of Pharmacology and Toxicology, School of Medicine, University of Southern California, Los Angeles; Consulting Member of Staffs of Huntington Memorial Hospital, Glendale Sanitarium and Hospital, Glendale Memorial Hospital, and Temple Hospital, Los Angeles; Consultant: Boyle & Company; Truesdail Laboratories; and Thomas J. Haley, Ph.D., Research Pharmacologist; Chief, Division of Pharmacology and Toxicology, Laboratory of Nuclear Medicine and Radiation Biology, University of California, Los Angeles. Lea & Febiger, Philadelphia, 1964. 661 pages, $9.50.

COLLEGE HEALTH ADMINISTRATION — Edited by Dana L. Farnsworth, M.D. Appleton-Century-Crofts, Division of Meredith Publishing Company, New York, 1964. 250 pages; (no price given).

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NEW BOOK

HANDBOOK OF MEDICAL TREATMENT. Edited by Milton J. Chatton, M.D., Sheldon Margen, M.D., and Henry Brainerd, M.D., 9th ed. 716 pages. 1964. Lange. $5.

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CONYBEARE'S TEXTBOOK OF MEDICINE — Fourteenth Edition—Edited by W. N. Mann, M.D. (Lond.), F.R.C.P., Physician to Her Majesty the Queen; Senior Physician to Guy's Hospital, London. E. & S. Livingstone Ltd., Edinburgh and London, 1964. The Williams & Wilkins Company, Baltimore, Md., exclusive U.S. agents. 1048 pages, $10.50.

CORNEAL CONTACT LENSES—By members of the Contact Lens Section, Department of Ophthalmology, Baylor University College of Medicine, Houston, Texas. Louis J. Girard, M.D., F.A.C.S., Professor and Chairman, Department of Ophthalmology, Baylor University College of Medicine; Director, Institute of Ophtholmology, Texas Medical Center, Editor; Joseph W. Soper, Clinical Instructor in Contact Lens Technology, Department of Ophthalmology, Baylor University College of Medicine, and Whitney G. Sampson, M.D., Assistant Professor of Ophthalmology and Chief, Section of Physiologic Optics, Department of Ophthalmology, Baylor University College of Medicine, Associate Editors. The C. V. Mosby Company, Saint Louis, 1964. 329 pages, $19.75.

THE DIFFERENTIAL DIAGNOSIS OF DIARRHEA—Edited by Sherman M. Mellinkoff, M.D., Dean and Professor of Medicine, University of California (Los Angeles) School of Medicine. McGraw-Hill Book Company, Blakiston Division, New York, 1964.

DISEASES OF METABOLISM — Detailed Methods of Diagnosis and Treatment — Fifth Edition, illustrated, edited by Garfield G. Duncan, M.D., Professor of Medicine, University of Pennsylvania; Director of Medical Divisions, Pennsylvania Hospital and The Benjamin Franklin Clinic. W. B. Saunders Company, Philadelphia and London, 1964. 1551 pages, $28.00.

DYNAMIC PATHOLOGY — Structural and Functional Mechanisms of Disease—Maurice M. Black, M.D., Professor of Experimental Pathology, New York Medical College, New York, N.Y.; Attending Pathologist, Flower and Fifth Avenue Hospitals, New York, N.Y.; and Bernard M. Wagner, M.D., Professor and Chairman, Department of Pathology, New York Medical College, New York, N.Y.; Pathologist, Flower and Fifth Avenue Hospitals, New York, N.Y. The C. V. Mosby Company, Saint Louis, 1964. 296 pages, $8.00.

FRACTURES AND ORTHOPAEDIC SURGERY FOR NURSES AND PHYSIOTHERAPISTS — Fifth Edition — Arthur Naylor, Ch.M., M.B., M.Sc. (Sheff.), F.R.C.S. (Eng.), F.R.C.S. (Edin.); Consultant in Orthopaedic Surgery, Bradford Royal Infirmary. Foreword by Sir Ernest Finch, M.D., M.S. (Lond.), F.R.C.S. (Eng.), formerly Vice-President, Royal College of Surgeons of England. The Williams and Wilkins Company, Baltimore, Md., 1964. 362 pages, $6.50.

INFECTIOUS DISEASES OF CHILDREN—Third Edition—Saul Krugman, M.D., Professor and Chairman, Department of Pediatrics, New York University School of Medicine, New York, N.Y.; Director of Pediatrics, Bellevue Hospital Center, New York, N.Y.; Director of Pediatrics, University Hospital, New York, N.Y.; Robert Ward, M.D., Professor and Chairman, Department of Pediatrics, University of Southern California School of Medicine, Los Angeles, Calif.; Physician-in-Chief, Children's Hospital, Los Angeles, Calif. The C. V. Mosby Company, Saint Louis, 1964. 423 pages, $15.75.

MANUAL OF MEDICAL THERAPEUTICS — Seventeenth Edition — Department of Medicine, Washington University School of Medicine, St. Louis, Mo. Current Editors: Robert C. Packman, M.D., and Robert D. Utiger, M.D. Little, Brown and Company, Boston, 1964. 272 pages, $4.50 (paperback).

MASSAGE—Principles and Techniques—Gertrude Beard, R.N., R.P.T., Formerly Associate in Physical Medicine and Technical Director, Course in Physical Therapy, Northwestern University Medical School; and Elizabeth C. Wood, A.M., M.S., R.P.T., Associate Professor of Physical Medicine and Educational Administrator, Programs in Physical Therapy, Northwestern University Medical School. Illustrations by Vicki Catalani, Photographer, Art and Photography Department, Chicago Wesley Memorial Hospital. W. B. Saunders Company, Philadelphia and London, 1964. 163 pages, $6.00.

A MISSION IN ACTION—The Story of The Regional Hospital Plan of New York University—Clarence E. De La Chapelle, M.D., and Frode Jensen, M.D. New York University Press, Washington Square, New York 3, N.Y., 1964. 177 pages, $4.00.

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It could be particularly helpful for workers whose tolerance for heat has been reduced by aging, heart disease, or other physiological impairment.

Comparable observations on acclimatized workmen with and without the device during periods of identical work in a severely hot environment resulted in a threefold reduction in heat loss, a 25 percent reduction in total heart beat, and a 50 percent reduction in the rate of body temperature rise for the air-conditioned man, according to the researchers.

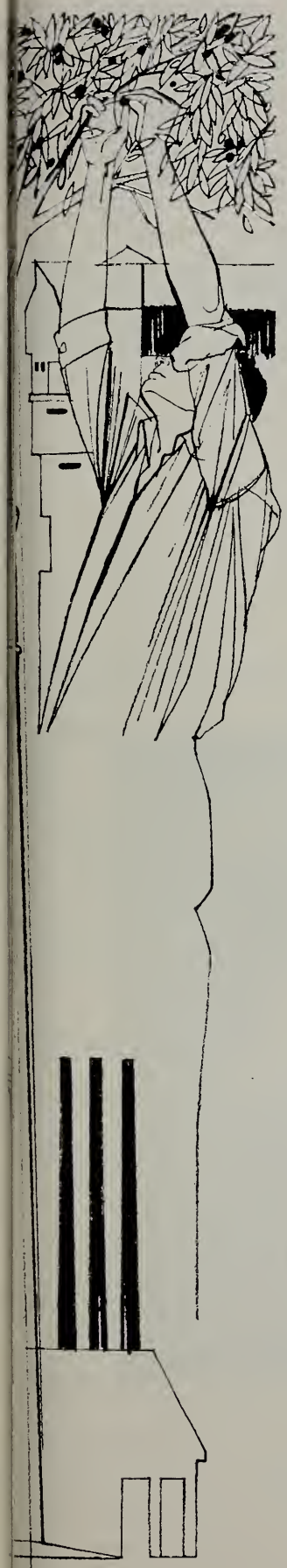
The entire weight of the personal air-conditioner is only 19 ounces, according to the report. The air is cooled by a vortex tube, invented in 1931 by a French metallurgist, George Ranque. Standard industrial compressed air is delivered through a hose to the tube attached by a belt to the man's waist. The tube converts compressed air at 120 degrees Fahrenheit to a steady flow at 65 degrees Fahrenheit.

The tube develops a hot and a cold stream of air, the authors explained. The hot air is exhausted into the atmosphere while the cool air is supplied over the upper part of the body through perforated flexible plastic tubing worn beneath the worker's shirt. The cool air, which is of breathing quality, also may be dispersed through a semi-rigid funnel into a fabric hood and vest, both worn over the shirt. The air escapes easily through the clothing and from beneath the fabric hood.

Each worker has a "breakaway" coupling so he can detach himself from the air supply hose simply and quickly in case of danger. Hoses 150 feet in length provide the worker a high degree of mobility.

The vortex tube also has the potential application for body warming during work in extreme cold by adding an air mixing valve to vary the proportions of hot and cold air streams, the researchers added. In this way, output air between 65 and 80 degrees Fahrenheit can be obtained when the temperature of input air varies as widely as —20 degrees up to 130 degrees Fahrenheit, they said.

None of the earlier systems proposed for individual air conditioning has been widely adopted in industry because in general they have been too complex and too costly for day-to-day use on most jobs, the researchers commented. Vortex tube units with accessory equipment are commercially available. The vortex tube alone costs less than $75.



Contact Dermatitis

Occupational dermatitis is a major economic, as well as medical, problem. It has been estimated that affections of the skin constitute about 60% of all medical diseases which are reported to compensation boards in this country, and that 10% of all dermatoses in the general population are of industrial origin.[1] The monetary loss resulting from occupational dermatoses is reported to amount to approximately 100 million dollars a year.[2]

Every contactant in a patient's environment must be considered a possible irritant or sensitizer; however, regardless of the etiology of this disease category, the need for immediate symptomatic relief is essential. Synalar (fluocinolone acetonide) has been documented as 97% effective in the management and control of contact dermatitis.

1. Pillsbury, D. M., *et al*, in collaboration with Samitz, M. H., Dermatology, W. B. Saunders Company, Philadelphia, 1960, p. 1263.
2. Kanof, N. B.: Permanent Disability from Industrial Dermatitis, *Arch Environ Health 4*:622, 1962.

Synalar (fluocinolone acetonide) 97% Effective in Contact Dermatitis

AUTHOR AND PUBLICATION	Total Number Cases	Improved	Unimproved
Robinson, H. M., Jr.: *Arch Derm 83*:149 (Jan) 1961	39	39	
Scholtz, J. R.: *Calif Med 95*:224 (Oct) 1961	5	4	1
Scher, R. K.: *Curr Ther Res 3*:461 (Nov) 1961	3	3	
Cahn, M. M. and Levy, E. J.: *J New Drugs 1*:262 (Nov-Dec) 1961	34	30	4
Bruner, H. L.: *JAmer Osteopath Assn 61*:527 (Mar) 1962	7	7	
Robinson, H. M., Jr., *et al*: *Bull Sch Med Univ Maryland 47*:21 (Apr) 1962	19	19	
Samitz, M. H.: *Curr Ther Res 4*:589 (Dec) 1962	88	87	1
Feldman, I.: *J Amer Osteopath Assn 63*:257 (Nov) 1963	22	22	
Dick, L. A.: *Skin 11*:371 (Dec) 1963	31	31	
Seigerman, H.: *Clin Med 71*:1042 (June) 1964.	61	57	4
Total	**309**	**299**	**10**

provide your patients with comfort after contact

For rapid and reliable reversal of the pruritus and inflammation of contact dermatitis, prescribe Synalar (fluocinolone acetonide), the topical corticosteroid that is replacing hydrocortisone in the management of inflammatory dermatoses.

Documented results show that this unique agent is highly effective in treating contact dermatitis, rapidly relieves pruritus and inflammation, is nonsensitizing, and is economical because less medication is required to rapidly achieve optimum results.

AVAILABLE: For initiation of therapy—Cream 0.025%, 5 and 15 gm. tubes. For maintenance therapy—Cream 0.01%, 45 gm. tubes. For emollient effect—Ointment 0.025%, 15 gm. tubes. For infected dermatoses—Neo-Synalar® (0.025% fluocinolone acetonide, 0.5% neomycin sulfate) Cream, 5 and 15 gm. tubes. PRECAUTIONS: Synalar (fluocinolone acetonide) preparations are virtually nonsensitizing and nonirritating. Neomycin rarely produces allergic reactions. As with all antibiotics, prolonged use may result in overgrowth of nonsusceptible organisms; if this occurs, appropriate therapy should be instituted. Although side effects are not ordinarily encountered with topically applied corticosteroids, as with all drugs, a few patients may react unfavorably. Where there is systemic infection or severe local infection, systemic antibiotics should be considered, based on susceptibility testing. CONTRAINDICATIONS: Tuberculous, fungal, and most viral lesions of the skin (including herpes simplex, vaccinia, and varicella). Not for ophthalmic use.

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F.D.A. Reversal on Antidepressant Supported in J.A.M.A. Editorial

(Continued from Page 34)

that, after further review and study, it was permitting the drug to return to the market on the condition that the manufacturer call adequate attention to all potential hazards associated with the drug.

Commenting on the F.D.A.'s handling of the situation, the editorial said, "the New Drug Amendments of 1962 and the regulations they have engendered have thrust tremendous administrative responsibilities on an agency which is inadequately staffed and which has been compelled to recruit personnel who have not yet had time to become adequately experienced. It is understandable that they become extremely concerned about a drug, the toxicity of which apparently was enhanced by concurrent and/or consecutive use of other agents and even by cheese and beer, to a degree not heretofore so well documented, at least in man.

"It is to the credit of the new medical director of the F.D.A., Joseph F. Sadusk, Jr., M.D., that the tranylcypromine controversy, which he inherited, appears to have been resolved by an objective appraisal of the medical and scientific data available."

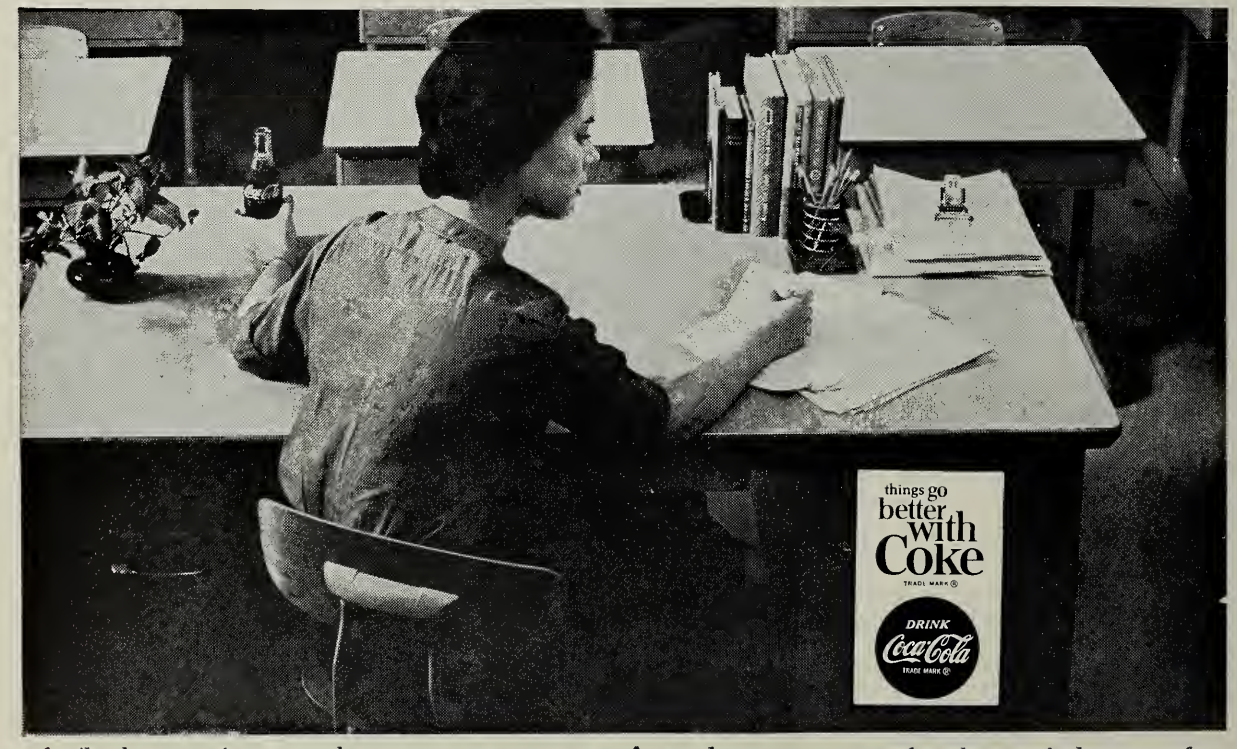
The history of medicine has demonstrated clearly that the medical profession—when it has the facts—can be trusted to utilize hazardous substances in the best interests of the patient, the editorial continued.

"It would be well for the F.D.A. to bear this in mind and to use its regulatory power with discretion in *any* area in which *a significant segment* of the medical profession agrees that a drug, even though potentially hazardous and having a certain risk in its use, can be used effectively to the best interests of patients. It appears from Dr. Sadusk's disposition of the tranylcypromine problem that he is aware of this, and that he realizes the difference between an *educational* problem (requiring an appropriate educational approach for solution) and an *imminent public health problem* (requiring prompt, decisive, regulatory action)."

The editorial also pointed out the importance of physicians keeping themselves informed on the potential benefit-to-risk ratio of drugs.

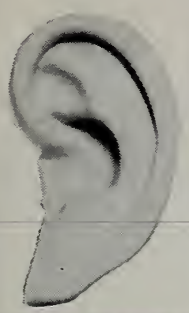
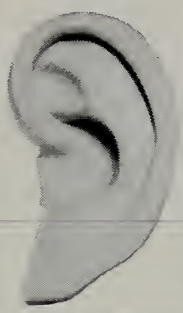
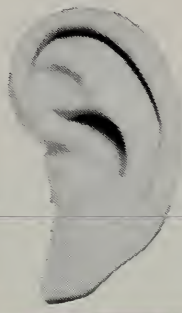
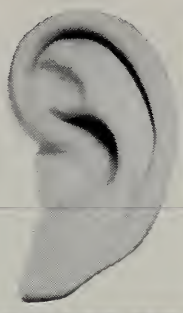
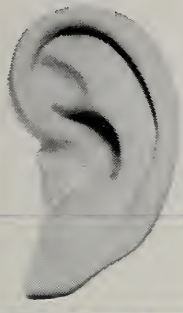
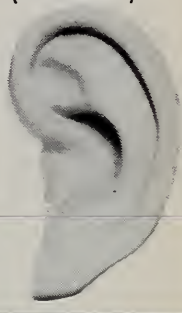
Reliable data on drugs are published as monographs in J.A.M.A. and are compiled and updated annually in a bound volume (New and Nonofficial Drugs) under the auspices of the A.M.A. Council on Drugs, it was pointed out. Another source of information is the package insert accompanying each drug which is the result of discussion among industry and F.D.A. physicians and scientists.

An updated monograph on tranylcypromine sulfate, prepared by the Council on Drugs, is published in the same issue of the Journal. The monograph incorporates all significant new data on the product, for the guidance of physicians in prescribing for patients.



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92.4% clinical response	**93.7%**	**88.4%**	**92.7%**	**97.0%**	**89.8%**

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Precautions: Although side effects are not ordinarily encountered with topically applied antibiotics and/or steroids, as with all drugs, some patients may react unfavorably under certain conditions. Should sensitivity or other idiosyncratic reactions occur, Coly-Mycin Otic should be discontinued. Overgrowth of nonsusceptible pathogenic organisms is possible, but rare.

Full information is available on request.

Bibliography: 1. Jenkins, B. H., and Senturia, B. H., cited by Saltzman, M.: Clin. Med. *70*:559, 1963. 2. Case histories on file in the Medical Department of Warner-Chilcott Laboratories. 3. Ettenger, M. S.: Pennsylvania M. J. *66*:35, 1963. 4. Pullen, F. W., II: Eye Ear Nose & Throat Month. *42*:38, 1963. 5. Mann, P. H.: Current Therap. Res. *6*:101, 1964.

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REFERENCES AND REVIEWS

Simulation of Human Responses to Heat Stress by an Analog Computer—P. E. Smith, Jr. (Haskell Laboratory for Toxicology and Industrial Medicine, Wilmington, Del.) and E. W. James II. Arch. Environ. Health, 9:332, (Sept.) 1964).

A dynamic mathematical model of the human heat transfer system was developed. It is capable of exhibiting both transient and steady state responses. This model includes the following factors: (1) the distribution of metabolic heat generation, (2) convective transport of heat by the blood stream, (3) conductive transfer of heat through the tissues, (4) storage of heat in the tissues, (5) loss of heat through the respiratory tract, and (6) loss of heat from the skin by radiation, convection, and evaporation. The rationale of the model is presented, together with an indication of the method of programming used. Validation of the model by comparison with the data obtained on human subjects is discussed, and the results presented. The model was used to predict results in untested areas. Laboratory data to check such predictions are presented.

* * *

Duodenal Obstruction Due to Intramural Hematoma—A. L. Watne (West Virginia University School of Medicine, Morgantown), G. W. Butz, and T. J. Tarnay. Arch. Surg., 89:441 (Sept.) 1964.

Duodenal obstruction secondary to intramural hematoma, which usually arises following blunt abdominal trauma, was reported in 36 cases. Characteristic roentgenographic signs are present and should lead to correct preoperative diagnosis. If the obstruction is not relieved in a few days by conservative treatment, surgical intervention is necessary for evacuation of the hematoma. The 37th case is reported with details of diagnosis and surgical management. Characteristic roentgenograms and operative pictures are included.

* * *

Evidence of Two Soluble rna Types in the Eye Lens—N. Virmaux, P. Mandel, and P. F. Urban (Institut de Chimie Biologique Ophthalmologique, Faculte de Medecine, Strasbourg, France). Biochem Biophys Res Commun, 16:308 (No. 4) 1964.

The authors state that there is a soluble ribonucleic acid (rna) fraction other than transfer rna in the cortical and central zones of the crystalline lens. It differs from adaptator rna in its molecular weight, in the absence of pseudouridylic acid, and its inability to bind amino acids. Its biological significance remains to be ascertained. Since this type of rna is present in partially dedifferentiated cells—i.e., lens fibers with lowered particulate rna content—the authors believe that it may result from ribosomal dissociation occurring in aging lens cells.

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Co-sponsors are the Society of Toxicology and the American Medical Association Committee on Cutaneous Health and Cosmetics.

The speakers, representing university laboratories, industry, and relevant government agencies, will appear at four sessions.

The topics: Session I—Absorption, Nature of the Threshold Barrier, Percutaneous Toxicity, and Sensitization Mechanisms; Session II—Pharmacogenetics, Predictive Testing Procedures—Irritation and Sensitization, Biometrics, and Clinical Aspects of Irritation and Sensitization; Session III—Need of Methods, Methods of Evaluating Skin Irritation, New Data on Eye and Skin Tests, and Skin Carcinogens; Session IV—Species Aspects and Human Correlation, Man vs. Animal Eye Testing, and Current Viewpoint of the FDA.

Moderating the four sessions will be: Harry W. Hays, Ph.D., Advisory Center on Toxicology, National Academy of Sciences, National Research Council, Washington, D.C., president of the Society of Toxicology, and a member of the AMA committee; Adolph Rostenberg Jr., M.D., professor of dermatology and head of the department, University of Illinois, Chicago, and member of the AMA committee; Raymond R. Suskind, M.D., professor and head, Division of Environmental Medicine, University of Oregon, Portland, and chairman of the AMA committee; and Fred Coulston, Ph.D., president-elect of the Society of Toxicology; editor of the Journal of Toxicology and Applied Pharmacology, and professor of experimental pathology and toxicology, and director of the Institute of Experimental Pathology and Toxicology, Albany Medical College of Union University, Albany, N.Y.

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Copper (from copper sulfate)	1 mg.
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Calcium (from dicalcium phosphate)	37.4 mg.
Iodine (from potassium iodide)	0.05 mg.
Manganese (from manganese sulfate)	0.033 mg.
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Maj. Gen. Howard W. Doan Joins A.M.A. September 1

Major General Howard W. Doan, M.C., Denver, joined the American Medical Association September 1 as director of the department of hospitals and medical facilities.

The department, established in 1963, is concerned with activities involving the relationship of physicians with the hospital, nursing home, and other medical care facilities.

General Doan, a native of LaSalle, Illinois, has been executive director of the office for dependents' medical care, Fitzsimons General Hospital, Denver, since September, 1963.

He was Executive Officer of the Chief Surgeon's Office, European Theater of Operations, during World War II; Superintendent of Gorgas Hospital, Canal Zone (1953-1956); Deputy Hospital Commander, Fitzsimons General Hospital (1956-1958); Surgeon, First U. S. Army (1958-1960); Director, Personnel and Training, Office of The Surgeon General (1960-1961); and Deputy Surgeon General, U. S. Army (1961-1963).

General Doan received his M.D. from the University of Iowa School of Medicine, Iowa City, and entered military service in 1933. He is 57, married, and the father of three children.

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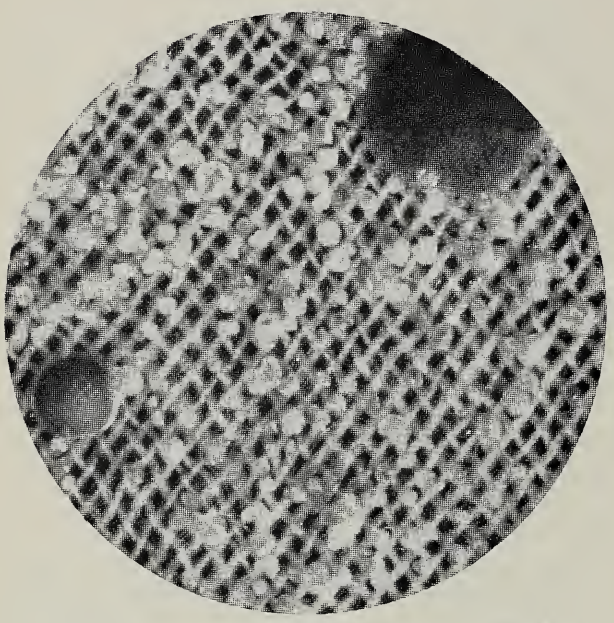
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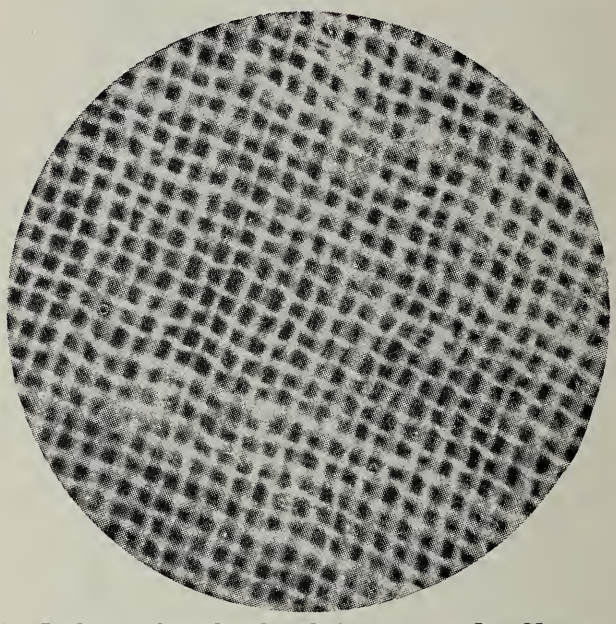
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3. The American Hospital Association Laundry Manual recommends the use of chlorine bleach in the hospital diaper wash. And hospitals use it—as a routine.



These facts support your advising mothers to use chlorine bleach regularly in laundering diapers. It is safer.

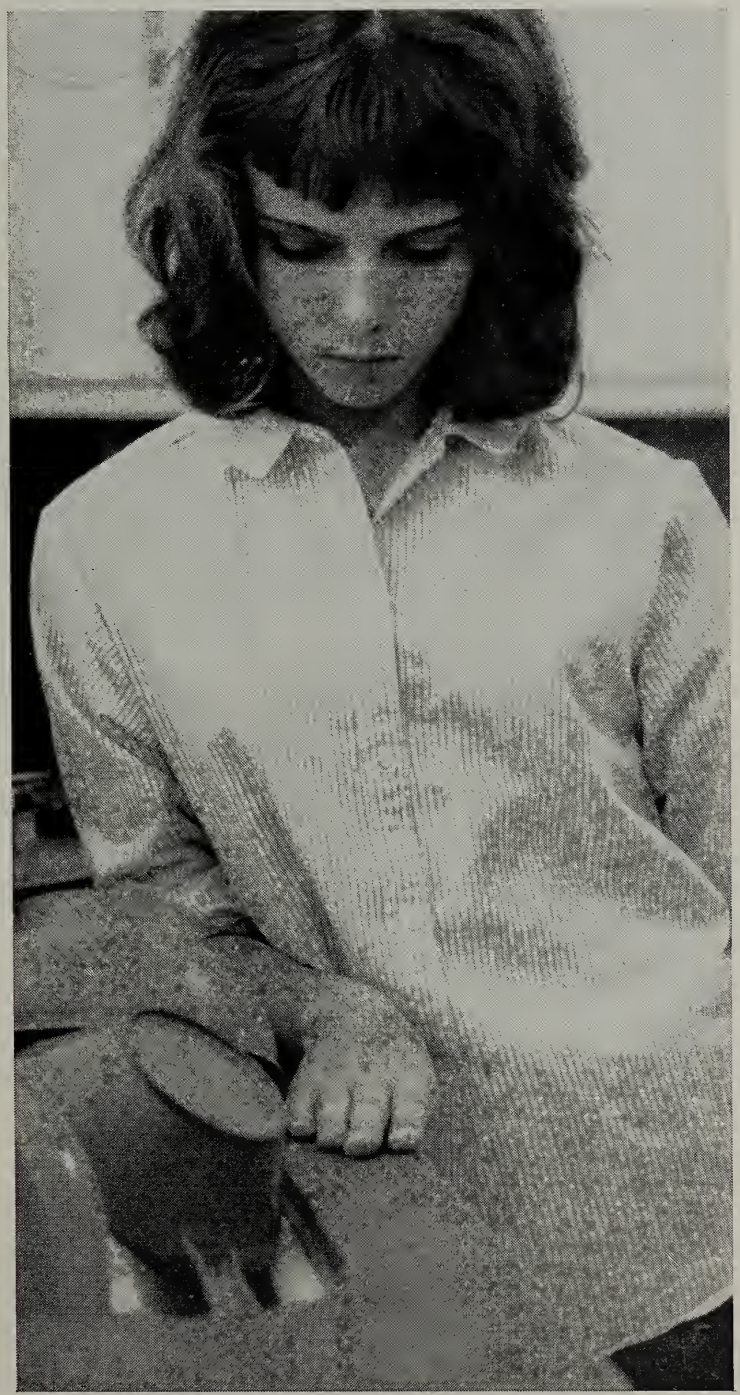
Additional information on the germicidal qualities of chlorine bleach is contained in the following studies: Klein, Morton and Deforest, Adamadia, "Antiviral Action of Germicides," Soap & Chemical Specialities 39:70-72, 95-97, July, 1963. Kundsin, Ruth B., Sc.D.; Walter, Carl W., M.D.; Ipsen Johannes, M.D.; and Brubaker, Mary Day, "Ecology of Staphylococcal Disease," The Journal of The American Hospital Assoc., July, 1963.

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How supplied: pHisoHex is available in unbreakable squeeze bottles of 5 oz. and 1 pint, in unbreakable plastic bottles of 1 gallon and in combination package with pHisoAc Cream.

References: 1. Szymanski, F. J.: *Indust. Med.* 30:498, Nov., 1961. **2.** Wexler, Louis: *Clin. Med.* 70:404, Feb., 1963. **3.** Hodges, F. T.: *GP* 14:86, Nov., 1956. **4.** McLean, I. E. D.; Graham, K. T., and East, M. O.: *Practitioner* 189:82, July, 1962.

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6230 Claremont Ave., Oakland 94618
J. Brandon Bassett.....Secretary
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1630 Del Valle Ave., Glendale 91208

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Joseph B. Ford, Jr. Secretary
2940 Fresno St., Fresno 93721

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Wells Carey.....Secretary
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Ernest Brock Secretary
200 S. Imperial Ave., Imperial 92251

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459 West Line, Bishop 93514

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Keith W. Spaulding.....Secretary
2521 "G" St., Bakersfield 93301

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Joseph E. Turner.....Secretary
1073 Cass St., Monterey 93940

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P. O. Box 658, Napa 94559
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Laurance A. Mosier.....Secretary
10510 Chapman St., Garden Grove 92640

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Arthur R. Weaver.....Secretary
701 High St., Auburn 95603

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Richard W. Trotter.....Secretary
6876 Magnolia Ave., Riverside 92506

SACRAMENTO Society for Medical Improvement, 5380 Elvas Ave., Sacramento 95819. Meets Third Tuesday, 8:30 p.m., Sutter Hospital Auditorium.
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James W. Martin.....Secretary
2811 L Street, Sacramento 95816

SAN BENITO County Medical Society. Meets once a month, except July and August. Time and place to be announced.
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Dora A. Lee.....Secretary
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SAN LUIS OBISPO County Medical Society. Meets Third Saturday, 7:00 p.m., Anderson Hotel, San Luis Obispo 93402.
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705 Grand Ave., San Luis Obispo 93402

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100 Laurel Ave., San Carlos 94401
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SANTA CLARA County Medical Society, 700 Empey Way, San Jose 95128. Meets First Monday.
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185 Sotoyome St., Santa Rosa 95405
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1667 Bloomfield Rd., Sebastopol 95472

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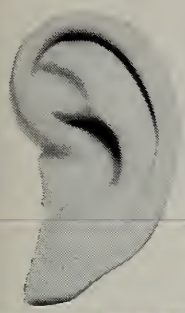
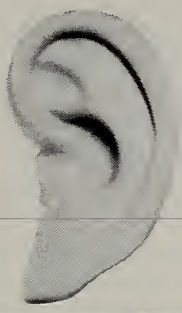
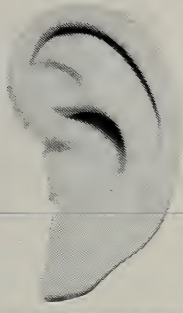
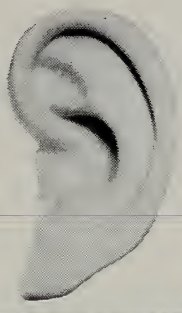
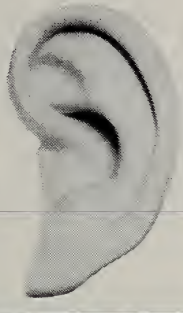
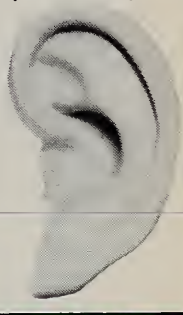
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Bibliography: 1. Jenkins, B. H., and Senturia, B. H., cited by Saltzman, M.: Clin. Med. *70*:559, 1963. 2. Case histories on file in the Medical Department of Warner-Chilcott Laboratories. 3. Ettenger, M. S.: Pennsylvania M. J. *66*:35, 1963. 4. Pullen, F. W., II: Eye Ear Nose & Throat Month. *42*:38, 1963. 5. Mann, P. H.: Current Therap. Res. *6*:101, 1964.

Improved Ultrasonic Device Used for Meniere's Disease

Improved ultrasonic equipment used to treat 65 patients with Meniere's disease, a disorder of the inner ear causing attacks of dizziness, relieved symptoms completely in 80 per cent.

The use of a "new and technically reliable" ultrasonic generator at Columbia Presbyterian Medical Center, New York, was discussed in an editorial in the September 21 *Journal of the American Medical Association.*

"There appears to be a significant increase in the number of patients suffering from Meniere's disease," the editorial said. "There is some evidence that strain and stress of day-by-day affairs have contributed to the rising incidence of this disease."

Until recently the only effective treatment was surgical destruction of the inner ear, which resulted in deafness in the treated ear.

Ultrasound, or the energy produced by high frequency sound waves beyond the audible range, can selectively destroy that part of the inner ear responsible for the symptoms of the disease, and hearing is preserved, according to the editorial.

The technique, introduced in Europe in 1952 for Meniere's disease, was described by Drs. Milos Basek and V. N. Epanchin, College of Physicians and Surgeons, Columbia University, in the September *Archives of Otolaryngology*, published by the American Medical Association.

High frequency sound waves, produced by a generator, are focused through a pencil shaped instrument into a narrow straight beam of energy. This energy, amounting to less than one watt, is directed to the labyrinth of the inner ear, which contains the sense organs of equilibrium, for about 20 minutes to destroy the activity of the labyrinth.

Numerous difficulties were encountered with previous ultrasonic equipment, the physicians pointed out. The biggest problem associated with the use of ultrasound for this disease is the possibility of damaging the facial nerve and causing mild paralysis, they said.

The generator used in this series of patients, which was made in Australia by George Kossoff, a physicist, is safe and efficient, the researchers said. For a skilled operator, the device is not difficult to use. Danger of facial nerve paralysis is less than five per cent and if paralysis occurs, it disappears in a few weeks without additional treatment.

LARGE SOLITARY CYSTIC LESIONS OF THE BREAST—B. Young and E. Samuel, Cancer, 17:1254 (Oct.) 1964.

This paper discusses the value of mammography in differentiating solitary cystic lesions of the breast from carcinoma. Mammography cannot always exclude a cancerous lesion within the cystic area, but from the x-ray films it should assure an excision biopsy rather than any other type of initial approach. This may be of particular value in the elderly patient.



Gun Pellet Travels from Heart to Artery

A rare injury in which a pellet from a high-powered air rifle entered a 10-year-old boy's heart and traveled into an artery in his arm was reported in the August 17 *Journal of the American Medical Association.*

The boy was shot in the chest from a distance of about 10 feet, according to Drs. Adrian J. Neerken and Frederick L. Clement, Kalamazoo, Michigan.

A gunshot pellet was found in the brachial artery of the right arm. The physicians said the pellet apparently had entered the lower right chamber of the heart, first, passed through an intervening wall and then was carried into the artery.

The pellet was removed from the artery, the wound repaired, and the boy made an uneventful recovery.

Progress Reported on Artificial Ear Organ

Speech has been transmitted to a previously deaf patient through an experimental electronic induction coil substituting for an essential organ of the ear, California researchers reported.

The device serves as an artificial organ of Corti, that part of the ear's sea shell-shaped cochlea which transforms sound waves into impulses transmitted to the brain via the acoustic nerve.

The report by James H. Doyle, B.S., John B. Doyle Jr., M.D., and Frederick Myles Turnbull Jr., M.D., Los Angeles, appears in the October *Archives of Otolaryngology,* published by the American Medical Association.

The induction coil used for this patient was a four-channel unit, the researchers explained. It was believed that electrical stimulation of several portions of the acoustic nerve independently might increase the band-width and enable the patient to obtain useful speech perception, they said.

Four separate electrodes were introduced in four different locations in the cochlea of the patient who had acquired perception deafness. Perception deafness results from conditions involving the cochlear structures or the nerve of hearing.

The four electrodes were stimulated in sequence. In this manner it was possible to introduce electrical signals at 600 cycles per second (cps) in four areas of the nerve which when combined would arrive at higher auditory centers at the rate of 2,400 cps, the authors said.

"Definite speech perception attained by such complex stimuli enabled the patient to repeat phrases," they reported.

However, they added, it now appears that a 16-channel unit will be required in order to pass audio signals similar to telephone transmission.

Dr. Doyle, a neurosurgeon, began work on an artificial organ of Corti in 1960 and reported initial success at the AMA clinical convention in Los Angeles in 1962. The research was based on the finding that in some persons acquired or congenital deafness is caused by a defective organ of Corti while they have a normal acoustic nerve.

"It is our hope," the researchers commented, "that this work will stimulate increasing cooperation between the disciplines of medicine and physics in the hope of achieving solutions to intricate and significant problems."

The authors are affiliated with the department of otolaryngology, Loma Linda University, Loma Linda, California, and the department of neurosurgery, School of Medicine, University of Southern California, Los Angeles and Garden Grove, California.

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Peptic Esophagitis

Its Surgical Significance

CARLETON MATTHEWSON, JR., M.D.
San Francisco

■ *Esophagitis caused by the reflux of acid gastric juices through an incompetent sphincter at the junction of the esophagus with the stomach is now recognized as a common cause of upper abdominal and thoracic symptoms frequently simulating heart, stomach or gallbladder disease. While these symptoms are occasionally mild and transient, under certain circumstances permanent, irreversible and seriously disabling changes may occur in the lower esophagus. The usual cause is a sliding hiatal hernia. Although mild symptoms can often be relieved by simple means, advanced disease may require a major surgical procedure to relieve scar tissue stricture of the esophagus which may eventuate and permanently disturb the swallowing mechanism.*

Hiatal hernia causing displacement of the cardioesophageal junction, the most common cause of esophagitis, can be corrected either by transabdominal or transthoracic surgical procedures directed toward reduction of the hernia. Fixation of the stomach to the abdominal wall in a position of downward traction has been used as a simple and successful means of correcting the hernia.

SINCE peptic esophagitis was first described by Winkelstein[9] in 1935 as a new clinical entity, there has been a growing interest in this problem. Only within the past few years, however, has the medical profession recognized the full significance of esophageal irritation as a cause of upper abdominal and thoracic complaints. It is now well known that regurgitation esophagitis represents the most common nonspecific inflammatory process in this organ. While symptoms may be relatively mild and fleeting when associated with transient cardioesophageal incompetence, under certain conditions reflux may lead to permanent, irreversible and seriously disabling changes in the lower esophagus. Experimentally, the esophagus, which is lined with squamous epithelium, has been shown to be less resistant to peptic digestion than any other portion of the gastrointestinal tract.

Under normal conditions the esophagus is protected from the regurgitation of acid gastric contents by a sphincter mechanism at the esoph-

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agogastric junction. Unfortunately, we are so wanting in knowledge regarding the operation of this mechanism, either in health or disease, that there is no unanimity of opinion about the basic anatomic and physiologic features of normal gastroesophageal continence.

For an understanding of the clinical problems associated with reflux of gastric juice into the esophagus, consideration must be given to the normal state and the changes that lead to incontinence. Of especial interest because of its structure and function is the portion extending from the upper limit of the ampulla to the esophagogastric junction, a segment making up approximately 20 per cent of the length of the organ. The level of the hiatus does not seem to help in defining the position of the underlying esophageal anatomic structure, nor does the diaphragm play any known coordinate part in the apparent specific functions of the lower esophageal structures.

The well-known controversy as to the presence or absence of an anatomically distinct sphincter at the cardia is less important to the clinician than the well-documented fact that there obviously is a physiological sphincter mechanism in this area which prevents the reflux of gastric contents and which apparently utilizes certain unspecialized circular muscle segments to cause segmental constriction readily demonstrable by esophagoscopic and radiological examinations. These observations are readily acceptable to most investigators.

In addition to these intrinsic factors, there appear to be other mechanisms involved, most prominent of which is the angle of entrance of the esophagus into the stomach, which under normal conditions forms a flap-like type of valve thought by some investigators to play a major role in the prevention of regurgitation.

Although the true nature of an anatomical sphincter has not as yet been proven, it is now well known that disturbances in the physiological sphincter mechanism, allowing recurrent or prolonged regurgitation of gastric contents into the esophagus, lead to inflammation and ulceration and ultimately to fibrosis and stenosis. Fibrosis will not only narrow the lumen of the esophagus, but eventually will cause longitudinal shortening. Here, again, opinions differ as to cause and effect. Many observers believe that congenital shortening of the esophagus leads to disturbances in the sphincter mechanism with resultant esophagitis and stricture, while others consider the shortening the result of fibrosis secondary to inflammation. Suffice it to say, for purposes of the present communication, that shortening associated with inflammation, fibrosis and stricture does occur in infants as well as in adults, and the therapeutic problem entailed is extremely difficult.

The primary pathophysiologic feature in reflux esophagitis is an incompetent cardiac sphincter. Because of sphincter incontinence, the regurgitation of gastric chyme occurs. The development of esophagitis and its complications is a secondary phenomenon. The inflammatory process usually is limited to the lower portion of the esophagus and particularly to that portion immediately above the cardiac orifice. In the early stages, granular erythema with edema manifests itself. Then, as the disease progresses, ulceration develops. The ulcers tend to be superficial and serpiginous. However, in the more advanced stages, large ulcers may eventuate which occasionally penetrate, causing localized fixation. A thin, yellow surface slough with underlying granulation tissue forms over the affected area. As such lesions bleed easily, chronic anemia often results. Progressive submucous fibrosis eventually leads to stenosis and stricture formation which may extend over an extensive area, resulting in decided shortening of the esophagus. As shortening occurs, the stomach is pulled upward into the thoracic cavity. Microscopically, there is epithelial necrosis and hyperplasia with pronounced degrees of polymorphonuclear infiltration and varying degrees of fibrosis, depending upon the chronicity and severity of the process.

Peptic esophagitis in the milder forms may be transient and is often associated with physiological processes leading to sudden or prolonged increases in intra-abdominal pressure. The most noteworthy of such processes are obesity and pregnancy. The acid regurgitation creating heartburn in the late stages of pregnancy is a common phenomenon and probably is related to a temporary incompetence of the cardiac sphincter brought about by the displacement of the abdominal organs and undue pressure on the stomach. Although distressing, this situation is relieved by delivery and does not lead to permanent changes in the esophagus. Milder degrees of peptic esophagitis are often encountered in association with gallbladder dysfunction and peptic disease of the duodenum. In these circumstances, pylorospasm with gastric retention and regurgitation accounts for the symptoms. Relief depends upon control of the basic disease of the gallbladder or duodenum.

Most commonly, however, this entity is observed in association with the sliding type of esophageal hiatal hernia, with surgical excision or destruction of the cardiac sphincter or with persistent vomiting. Occasionally it occurs following the prolonged use of indwelling nasogastric tubes.

In our experience, persistent vomiting and the use of nasogastric suction are not common causes

of peptic esophagitis. However, when the disease does occur from such causes the process is apt to be fulminating in nature, to develop rapidly and to be very severe. Ulceration with bleeding and the early formation of strictures are not uncommon.

The development of esophagitis in association with hiatal hernia and following operations upon the cardia is more insidious and slowly progressive. Any operation which disturbs the esophagogastric sphincter mechanism may eventually lead to prolonged and repeated regurgitation, with the eventual development of peptic esophagitis and its sequelae. Most of the cardioplastic procedures carried out in the past for the treatment of achalasia, at first thought to have been successful because of the relief of cardiospasm and obstruction, eventually led to reflux esophagitis and its complications. Such also has been the case too frequently following excision of the cardia with restoration of gastrointestinal continuity by esophagogastrostomy.

By far the most common defect demonstrable in association with esophagitis is that of a hiatal hernia of sliding type which allows elevation and displacement of the cardio-esophageal junction. The esophagus is shortened and does not extend to the level of the diaphragm. While there is still a great diversion of opinion regarding the causes of the incontinence at the cardia in hiatal hernia, my own studies seem to support the opinion of other investigators that the angle of entrance of the esophagus into the stomach is disturbed, thus obliterating one of the most important factors in the prevention of regurgitation. It is well known that not all hiatal hernias cause symptoms; in fact, some of the largest and most easily demonstrable do not. However, it is important to recognize that there is a great variation in the anatomical relationship between the defective hiatus and the esophagus, resulting in involvement of different structures and in the development of hernias of different types. It would appear from my own observations as well as those of other investigators that it is only when the esophagogastric junction has been displaced, altering the angle of entrance of the shortened esophagus into the stomach, that regurgitation and esophagitis ensue. In my experience the symptoms associated with para-esophageal hiatal hernia, in which the angle of entrance of the esophagus into the stomach has been preserved, are due to pressure and are not the symptoms associated with esophagitis. In contradistinction, in the sliding type of hernia with a disturbed esophagogastric angle, the symptoms are almost exclusively attributable to esophagitis. In the presence of ulcer diathesis, with or without a demonstrable peptic ulcer, reflux greatly aggravates the symptoms.

The symptoms of peptic esophagitis are variable, depending of course upon the stage of the disease and the etiological factors. In the milder forms, periodic and transient degrees of heartburn may be the only presenting symptom. As the disease progresses, esophageal spasm may cause regurgitation and vomiting with substernal discomfort on swallowing. Progressive anemia may be an associated factor. Bleeding, while frequent, is not usually massive or severe. However, occasionally massive upper gastrointestinal hemorrhage has been described, particularly in the presence of acute ulceration. When a sliding hernia is present, the symptoms may appear mainly at night with the patient recumbent and may be relieved by his assuming a sitting or upright position. During the day, forward bending may initiate symptoms.

When cardiospasm occurs, or particularly when progressive fibrosis and stenosis develop, dysphagia with nausea and vomiting, mainly of solid foods, becomes prominent and makes differentiation from carcinoma difficult.

The diagnosis depends upon roentgenographic and esophagoscopic findings. Physical signs are absent except for varying degrees of inanition as the disease progresses.

Inflammation, spasm, ulceration and fibrosis may all be recognized by a trained endoscopist. However, since all of these findings may be present in combined inflammatory and malignant disease, esophageal biopsy becomes an essential part of examination.

X-ray studies may be relatively diagnostic and the findings will depend upon the stage of the disease. Roentgenographic changes are usually absent in the early stages of hyperemia and mild inflammation. However, even early in the course of the disease there may be a fine irregularity without a clear delineation of the normal mucosal pattern. Esophageal spasm may be evident in the more advanced cases. Varying degrees of esophageal stenosis occur typically just above the cardia. The transition from the proximal esophagus, which may be dilated, to the strictured area usually is gradual and symmetrical. Esophageal ulcer may be demonstrable as well as other associated pathologic change. The presence of a hiatal hernia of sliding type is easily overlooked; when such a condition is suspected, special technique should be instituted to demonstrate it.

From the therapeutic point of view, peptic esophagitis presents an equal challenge to internist and surgeon. Prophylaxis is extremely important in light of the irreversibility of the late changes that may occur. It is important to recognize the etiological factors concerned, the better to anticipate the progress of the disease process which may follow

and to try to prevent it rather than treat the irreversible condition. Medical management is in most respects, similar to that instituted to control the acid secretions in peptic disease of the stomach and duodenum. In addition, attempt should be made to minimize reflux by urging good posture upon the patient, reduction of body weight and avoidance of compressing garments. Bending at the waist should be avoided, as should sleeping completely prone. When these measures fail or when the etiologic factor is an anatomically correctable defect, early surgical correction with the restoration of normal anatomical relationships may prevent more serious changes and avoid the major surgical procedures necessary for the correction of esophageal stricture.

Bouginage may be a useful adjunct to treatment, particularly in the presence of cardiospasm; however, it should be recognized that dilation of fibrous strictures, while perhaps permitting food to pass more readily, may at the same time aggravate the basic condition by permitting regurgitated gastric juice to reach higher levels in the esophagus.

The surgeon's role in the treatment of this disease is an important one. As he is usually not called upon until the disease has reached an advanced stage, he should be interested in its prevention. He is the main offender as regards injudicious or prolonged use of nasogastric suction. In anticipation of this problem, temporary gastrostomy rather than nasogastric suction, when prolonged suction is anticipated, should be recognized as a safe and acceptable procedure. The surgeon should appreciate the significance of gastroesophageal reflux and its sequelae, as well as the fact that any surgical procedure which destroys the esophagogastric mechanism will eventually lead to reflux and its complications. He, therefore, should avoid operations upon the esophagogastric junction unless it is already so disturbed that it no longer may act as a sphincter or is so diseased that it may interfere with the life of the patient.

When it becomes essential that the cardioesophageal junction be revised, it must be appreciated that, in the absence of a sphincter, regurgitation will occur. Further degrees of esophagitis can be prevented only by selecting a surgical procedure which will either prevent postoperative gastroesophageal reflux or will render the patient achlorhydric and still maintain gastrointestinal continuity.

Surgical repair of a sliding esophageal hiatal hernia is indicated in most cases of reflux esophagitis when these conditions coexist and is, by all means, the most successful therapeutic procedure applicable under these circumstances. Unfortunately, however, surgical repair of a hiatal hernia is of no avail if delayed until after stricture and shortening have occurred. Indeed, in these circumstances it is usually impossible, because of the shortening secondary to fibrosis, to restore the normal position of the cardia at the level of the hiatus.

Confronted with such circumstances, the surgeon must resort to more radical operative procedures, most of which are hazardous and associated with a high rate of morbidity and mortality. The area of stricture must be resected and gastrointestinal continuity must be reestablished. However, when the cardia is resected the sphincter mechanism is destroyed, and unless it is restored by some means, regurgitation will eventually lead again to esophagitis and its sequelae. Although many ingenious methods have been proposed to reestablish a sphincter in this area, none have been completely successful.

In the presence of advanced stricture formation, the simplest means of repair is esophageal resection with reestablishment of gastrointestinal continuity by esophagogastrostomy. Unfortunately, although the stricture is removed by this procedure, gastroesophageal reflux persists and recurrent esophagitis frequently occurs above the site of anastomosis. Pyloroplasty, as an adjunct to this procedure, tends to reduce the amount of regurgitation by allowing free egress of gastric contents into the duodenum.

Resection of the esophageal stricture, accompanied by resection of the acid-bearing proximal stomach, with esophagogastric anastomosis between the antrum and proximal esophagus, will prevent acid regurgitation but is frequently complicated by the late development of intractable type of anemia.

Vagotomy and antral resection after resection of the esophageal stricture, with re-anastomosis of the proximal stomach to the esophagus and the distal stomach to the duodenum, has been reported as a successful means of treatment. Acid secretion, in these circumstances, is controlled by the antrectomy and vagotomy; however, gastroesophageal reflux still occurs, and it remains to be seen whether or not the esophageal mucosa will tolerate the regurgitation of alkaline gastric contents.

In recent years a widely used method of reestablishment of continuity between the esophagus and stomach has been the interposition of a segment of jejunum, as advocated by Merendino.[7] He showed that such a small bowel segment actually functions as a sphincter, preventing reflux of stomach contents into the esophagus. When anatomically feasible, this operation is acceptable, but it is particularly hazardous because of the precarious blood supply to the transplanted jejunal segment.

Because of technical problems associated with an interposed jejunal segment, many surgeons more

recently have been utilizing colon rather than small bowel as the interposed segment. Time alone will determine the success or failure of this procedure. I have had particular success with this method in the management of caustic strictures of the esophagus, but am not prepared, from personal experience, to recommend it for the management of advanced cases of peptic esophagitis.

Fortunately, in the great majority of cases of peptic esophagitis the disease has developed in association with a hiatal hernia of sliding type and the symptoms usually are relieved by adequate repair of the hernia. Although the results of repair of esophageal hiatal hernia by either a transpleural or transperitoneal approach are generally satisfactory, by no means does either method consistently bring about complete relief of symptoms. Bradshaw recently reported persistence of symptoms in 16.5 per cent of cases after repair, exclusive of cases in which there was recurrence. Brintnall[4] reported treatment failure in 42 per cent of cases.

Because of experiences such as these, a number of different methods of surgical repair have been suggested. Until recently, most methods of repair were fashioned after the transthoracic approach of Allison or the transabdominal route of Harrington.[6] Numerous modifications of these techniques have been devised, most of which include fixation of the cardio-esophageal juncture at its normal level in relation to the diaphragm and approximation of the crura of the diaphragm in front of or behind or lateral to the esophagus. Most recently, operations have been proposed which, in addition to correcting the anatomical defect, include methods devised to reduce gastric acidity and promote rapid emptying of the stomach.[2]

It is noteworthy that both Nissen[8] of Germany and Boerema[3] of Holland have reported excellent results from very simple surgical repairs directed only toward fixation of the cardio-esophageal juncture at its normal level in relation to the diaphragm by suture of the stomach to the undersurface of the diaphragm. By this means, they attempt to restore the angle of entrance of the esophagus into the stomach. In their hands this operation prevents reflux and effectively relieves symptoms.

In 1960, Colonel H. H. Ziperman[10] and I became interested in this simple approach after it was noted at operation that a sliding hernia was easily reduced by caudad traction on the lesser curvature of the stomach. As long as this traction was maintained, the peritoneum, which originally constituted the hernia sac, seemed to bridge the defect in the hiatus, preventing further herniation. When the traction was released the hernia recurred. We had long been impressed by the futility of attempting to prevent herniation by simple closure of the crura of the diaphragm about the esophagus, particularly in view of the necessity of leaving a defect sufficiently large to protect the eosphagus against constriction. Indeed, in the past we have often found the crura so attenuated that it was impossible to approximate them effectually about the esophagus. However, in these circumstances a repair directed only toward reestablishment of the cardio-esophageal angle proved effective. It also occurred to us that if indeed the angle was the important factor as regards the sphincter action, and this angle could be reestablished and maintained by fixed traction on the lesser curvature of the stomach. Gravity, when the patient is in the upright position, should be an aid in maintaining traction, as opposed to our usual inability to keep organs in the proper position against the force of gravity.

For these reasons it seemed worthwhile to attempt repair by simple fixation of the lesser curvature of the stomach to the anterior abdominal wall in a position entailing sufficient tension that one could no longer force one's finger into the hiatal defect. This was accomplished by forcefully pulling the stomach on its lesser curvature downward and forward until the hernia defect was no longer palpable and then fixing the stomach in this position to the anterior abdominal wall with a series of silk sutures. This procedure was first attempted in a patient who had a hiatal hernia incidental to other abdominal disease. Following operation the hernia was no longer demonstrable. Since then we have used this simple method in many patients with hiatal hernia, particularly when the hernia was found in conjunction with other intra-abdominal disease and we were reluctant to subject the patient to repair of a more extensive type. To date, the results have been most gratifying. The preliminary results and follow-up on a group of patients treated by this simple maneuver have been reported elsewhere.[10]

For a good-risk patient in whom the diagnosis is certain and there is no other intra-abdominal disease, the most reasonable procedure would seem to be transthoracic repair from above the diaphragm with particular emphasis on fixation of the cardio-esophageal junction at the level of the diaphragm. Too frequently, however, this ideal situation does not exist and laparotomy is essential to a reasonable diagnosis. In these circumstances, particularly in obese or elderly patients or when other intra-abdominal procedures must be undertaken, it may be anticipated that an attempt to fix the gastroesophageal junction and stomach from below the diaphragm, to say nothing of the approximation of the crura, may be difficult and possibly hazardous. Perhaps many of the surgical failures

reported may be attributable to poor repairs under these conditions. We have chosen, in these patients, to utilize the simple pull-down procedure described.

Sometimes for a patient who has a healed or active peptic ulcer in addition to a hiatal hernia we choose vagotomy, pyloroplasty and gastrostomy high on the lesser curvature with fixation of the stomach at the site of the surgical opening to the anterior abdominal wall in a position of caudad traction. This effectively reduces the hernia and maintains the reduction. The few patients who have been treated in this manner have been particularly pleased with the results and we have been impressed with the simplicity of the operation and the uneventful convalescence.

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REFERENCES

1. Allison, P. R.: Reflux esophagitis, sliding hiatus hernia, and the anatomy of repair, S. G. & O., 92:419, 1951.

2. Berman, J. K., Berman, E. J.: Balanced operation for esophagitis associated with esophageal hiatus hernia, Arch. Surg., 78:889, 1959.

3. Boerema, I.: Gastropexia anterior geniculata for sliding hiatus hernia and for cardiospasm, J. Internat. Coll. Surgeons, 29:533, 1958.

4. Brintnall, E. S., Blome, R. A., and Tidrick, R. T.: Late results of hiatus hernia repair, Am. J. Surg., 101:159, 1961.

5. Burford, T. H., Fischer, C. E.: Treatment of short esophageal hernia with esophagitis by Finney pyloroplasty, Ann. Surg., 144:647, 1956.

6. Harrington, S. W.: Diagnosis and treatment of various types of diaphragmatic hernia, Am. J. Surg., 50:381, 1940.

7. Merendino, K. A., Dillard, D. H.: The concepts of sphincter substitution by an interposed jejunal segment for anatomic and physiologic abnormalities at the esophagogastric junction, Ann. Surg., 142:486, 1955.

8. Nissen, R.: Repair of espohageal hiatus hernia by fixation to the abdominal wall, Current Surgical Management II, W. B. Saunders Co., Philadelphia, 1960, p. 57.

9. Winkelstein, Asher: Peptic esophagitis: a new clinical entity, J.A.M.A., 104:906-909, Mar., 1935.

10. Ziperman, H. Haskell, Mathewson, C., Stanck, R. G., and Brugger, A. M.: Hiatal hernia repair by intraperitoneal gastric fixation, S. G. & O., 116:608-612, May, 1963.



Blood Phenylalanine Levels of Newborn Infants

A Routine Screening Program for the Hospital Newborn Nursery

H. R. IRWIN, M.D., S. NOTRICA, PH.D., *and*
W. FLEMING, B.A., M.T., *San Diego*

■ *If phenylketonuria is diagnosed during the first few weeks of life, a special diet can be given to prevent the brain damage that otherwise will occur.*

A simple, cheap, accurate laboratory test has been developed to diagnose the condition in infants two to four days old before they leave the hospital.

At the Donald N. Sharp Memorial Community Hospital in San Diego routine testing of all newborn infants has been done with this technique since August 26, 1963. Mass screening programs in the newborn nursery are already being carried out by large numbers of hospitals across the United States.

PHENYLKETONURIA is caused by an inherited error in metabolism which is autosomal and recessive. Approximately one adult in 50 is a carrier of this trait. The incidence is approximately one in 11,000 live births.[4] A person so affected lacks a liver enzyme, phenylalanine hydroxylase. Phenylalanine, which constitutes approximately five per cent of all natural protein food, is absorbed into the blood of these persons but is not converted to tyrosine because of lack of this enzyme. The phenylalanine concentration, therefore, rises in the serum. In an untreated infant with this disease the serum phenylalanine level rises to 15 to 60 mg per 100 ml. It is believed by some experts in the field that the damage in the undeveloped brain is already occurring by the time the blood phenylalanine level has risen to 10 mg per 100 ml.[12] This happens two to six weeks after birth.

The brain damage is permanent and irreversible, and nine out of ten persons with phenylketonuria who are not treated have permanent mental deficiency with a median intelligence quotient of 10 to 30. Most of these mental defectives end up in state-supported institutions. Their life expectancy is considered to be only slightly less than normal. This disease, therefore, not only brings heartbreak and hard-

Presented before the Section on Pathology and Bacteriology at the 93rd Annual Session of the California Medical Association, Los Angeles, March 22 to 25, 1964.

Sumerlin Memorial Pathology Laboratory, Donald N. Sharp Memorial Community Hospital, San Diego.

TABLE 1.—*Serum Phenylalanine Levels of 2 to 3-Day-Old Infants (2,088 Tested)*

Mg per 100 ml	No. of Infants
Normal range—	
0 to 1.0	56
1.1 to 1.5	272
1.6 to 2.0	709
2.1 to 2.5	591
2.6 to 3.0	324
Warranting further examination—	
3.1 to 3.5	89
3.6 to 4.0	17
4.1 to 4.5	13
4.6 to 6.5	12
Over 6.5	5
Total	2,088

ship to a family but is of public health importance. At present there are 89 known phenylketonuric patients in state-supported institutions in California and, based on present costs, the taxpayers of California can expect to pay $100,000 to $125,000 for the care of each of them.[10]

The disease was first described by Fölling[3] in Norway in 1934, and his ferric chloride urine test has been used for the past 30 years to test inmates of mental institutions. In the past six to seven years pediatricians have used this test in their offices (the wet diaper test) when checking for the disease.

There are some serious drawbacks in using the urine ferric chloride test. In some phenylketonuric patients with elevated serum phenylalanine the result of the test is negative. Usually the reaction to this test is not positive until the serum phenylalanine is greater than 20 mg per 100 ml.

In 1958 a paper-strip method for testing the urine was reported[1] and the Ames Company produced the Phenistix®, which now is widely used for testing in a physician's office. The Phenistix is more sensitive than the ferric chloride test, and there are fewer false negative results. One problem, however, is that the Phenistix generally will not detect the presence of the phenylpyruvic acid in the urine until the blood phenylalanine level rises to 10 to 20 mg per 100 ml.

The office testing method has some serious drawbacks. If the physician is busy an inexperienced nurse or doctor's assistant might do the testing and the result might not be read properly if the Phenistix shows a color other than the blue-green or grey it is supposed to show if the urine is positive for phenylpyruvic acid. Also the result must be read immediately, for the "positive" color disappears. Another drawback is that the infant may not be taken to the physician's office until several months after birth, time enough for some of the brain damage of phenylketonuria to take place. On many occasions an infant arrives at a physician's office with a dry diaper and the test cannot be done.

Having the hospital give the mother of a newborn infant a do-it-yourself Phenistix testing kit when she takes the baby home has not been too successful, for she may not understand the importance of carrying out the instructions.

In 1960, LaDu[9] described an ultra-violet method for a spectrophotometric serum phenylalanine determination. This method is complicated, requires expensive equipment and would be difficult to adapt to inexpensive mass screening.

A paper chromatography method has been described[2] which we have used in our laboratory for approximately two years. We believe that this could be adapted for the mass screening of large numbers of serum specimens. It is semi-quantitative at best, however, and we do not believe it to be the preferred method.

The first practical method for the mass screening of blood levels, a bacterial inhibition assay test, was first described by Guthrie in the latter months of 1961.[5,6,7]

A fluorometric method that was described in May of 1962 by McCaman and Robins[11,8] is used for screening all infants born in the Donald N. Sharp Memorial Community Hospital. Our routine newborn nursery screening program was instituted on August 26, 1963. To date, approximately 2,500* infants have been screened. The first 2,038 were tested both by the Guthrie bacterial inhibition assay method and the fluorometric method. These tests were run in parallel to evaluate the relative accuracy, to compare the difficulties of running the tests routinely, to appraise the sensitivity of the results of the test and to determine costs by each method.

From these parallel tests we concluded that the fluorometric method was accurate and more sensitive; the problems of performing the test routinely, using a medical laboratory technologist, were not a contraindication; and when at least a hundred specimens were tested at a time, the cost of performing the test was approximately 85 cents. The cost can be reduced by automating certain parts of the procedure.

It costs us, because of infection control precautions, and the distance of the nursery from the laboratory, approximately 80 cents to obtain the blood specimen from the infant.

In our opinion normal phenylalanine levels for infants two or three days old must be considered to be less than 3 mg per 100 ml. The phenylalanine levels for the first 2,088 newborns screened are presented in Table 1. Eighty-five per cent of them had a serum phenylalanine level of 3 mg or less per 100 ml. The 15 per cent of infants with levels greater

*This number has now been brought up to approximately 5,000.

than that are probably normal, but they must be carefully observed by their physicians to make sure that their phenylalanine levels drop to normal.

In our program, we notify the attending physician if an infant's serum phenylalanine level is greater than 3 mg per 100 ml. We urge the physician to check the infant in the first two to four weeks of life, because this infant may be the one in 11,000 we are looking for.

Table 2, in which the results obtained by the fluorometric procedure are compared with those of the Guthrie method, supports our belief that the fluorometric procedure is the one of choice when testing two to three-day-old infants. In San Diego, the infants are routinely discharged from the hospital on the second to third day of life.

The Children's Bureau estimated that until wide publicity was given to Guthrie's reports, no more than 10 per cent of all newborns in the United States were screened for phenylketonuria. Dr. Guthrie, in conjunction with the U. S. Department of Health, Education and Welfare, began a mass screening program of 400,000 newborn infants in July, 1962.

A state law has been passed in Massachusetts requiring every newborn to be tested for phenylketonuria before leaving the hospital.† Many hospitals throughout the country, particularly on the East Coast and in the Midwest, have voluntarily instituted programs. Hospitals in Nevada are screening practically all the newborns in that state.

California is behind in phenylketonuria testing in hospitals. Since in this state approximately 99 per cent of all births occur in hospitals, there is opportunity to screen almost every newborn infant in the state. Based on the number of live births in this state in 1963, we can expect approximately 35 babies with phenylketonuria to be born in this state in 1964.

The PKU problem has been brought to the attention of the general public by magazines and newspapers. As early as November, 1959, an article on the subject appeared in the *Saturday Evening Post.* Articles by science writers have appeared in several large newspapers throughout the country.

The late President Kennedy, in his nationwide address on mental health in February, 1963, stated, "We must seek out the causes of mental illness and mental retardation, and eradicate them."

Phenylketonuria is unique because it is now easily detected, and because its successful dietary management represents one of medicine's first footholds in the prevention of mental deficiency.

We believe that routine hospital screening of newborn infants will virtually eliminate the elevated phenylalanine cause of mental retardation.

We now have practical, inexpensive, accurate methods for mass screening of all newborn infants for phenylketonuria.

TABLE 2.—*Comparison of Sensitivity of Fluorometric Test With That of Guthrie Test in 136 Cases of Newborns Shown by Fluorometric Test to Have Suspiciously High Serum Phenylalanine Levels**

Serum Phenylalanine mg per 100 ml	*Fluorometric*	*Guthrie Elevated*
3.1 to 3.5	89	2
3.6 to 4.0	17	2
4.1 to 4.5	13	5
4.6 to 5.0	6	3
5.1 to 5.5	2	0
5.6 to 6.0	2	2
6.1 to 6.5	2	2
Over 6.5	5	4
Total	136	20

*Most of infants were discharged from hospital by third day of life.

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REFERENCES

1. Baird, H. W. III: A reliable paper-strip method for the detection of phenylketonuria, J. Ped., 52:715-717, June, 1958.

2. Berry, H. K.: Paper chromatographic method for estimation of phenylalanine, Proc. Soc. Exptl. Biol. & Med., 95:71-73, 1957.

3. Fölling, A.: Phenylpyruvic acid as a metabolic anomaly in connection with imbecility, Z. Physiol. Chem., 227:169, 1934.

4. Guthrie, R., Ph.D., M.D., Research Associate Professor of Pediatrics, University of Buffalo Medical School: Personal communication.

5. Guthrie, R.: The inhibition assay: A method for detecting chemical differences in clinical specimens, Proc. Soc. Ped. Res., 31st Meeting, 1961.

6. Guthrie, R.: Blood screening for phenylketonuria, J.A.M.A., 178:863, 1961.

7. Guthrie, R.: Blood screening for phenylketonuria, Proceedings of X International Congress of Pediatrics, 1962.

8. Hsia, D. Y., Litwack, M., O'Flynn, M., and Jakovic, S.: Serum phenylalanine and tyrozine levels in the newborn infant, N.E.J.M., 267:1067-1070, Nov., 1962.

9. LaDu, B. N., and Michael, P. J.: An enzymatic spectrophotometric method for the determination of phenylalanine in the blood, J. Lab. Clin. Med., 55:491, 1960.

10. Montgomery, Theodore A., Child Health Consultant, Bureau of Maternal and Child Health, Department of Public Health, Berkeley, California: Personal communication.

11. McCaman, M. W., and Robins, E.: Fluorometric method for the determination of phenylalanine in serum, J. Lab. & Clin. Med., 59:885-890, 1962.

12. Woolf, L. I.: Inherited metabolic disorders, Adv. in Clin. Chem., 6:97, 1963.

†State laws have now been passed in New York, Rhode Island, and Louisiana. Three other states, Illinois, Oregon, and Minnesota, have adopted the test pattern through legislation or as a matter of public policy. All hospitals in the state of Maryland will be screening their newborns before the end of 1964.

Cancer of the Bladder

Combined 5-Fluorouracil and Cobalt-60 Teletherapy

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■ *Three major attacks have previously been used on invasive carcinoma of the urinary bladder—surgical extirpation, irradiation therapy and chemotherapy. Of the chemotherapeutic agents, only systemic 5-fluorouracil has proved to possess merit. In a study of therapy with a judicious combination of these three therapeutic approaches in 32 cases, it appeared that tumor response was better and there were fewer major complications than with therapy by any one method. The report is preliminary, as the period of observation is not yet long enough.*

The cure rate of infiltrating bladder carcinoma has been disappointing. Sporadic cures have been achieved in selected cases by a variety of methods of treatment including interstitial radiation, partial cystectomy, total cystectomy and external irradiation. However, the outlook for a patient with aggressive bladder tumors remains gloomy and improved techniques of therapy are needed. The purpose of this preliminary report is to review the results of treatment of infiltrating bladder tumors by surgical, radiotherapeutic and chemotherapeutic methods and to present the early results of treatment with a combination of these methods in 27 patients who were observed for periods up to 32 months.

The studies of Jewett and Strong and Whitmore and Marshall indicated close relationship between the depth of bladder wall invasion by tumor and the potential curability. (Table 1 lists the staging of bladder cancer according to the classifications of Jewett and Marshall.) It is generally agreed that patients with tumors showing only superficial infiltration (Stage O, A, B-1) have a uniformly better outlook than patients with deeply infiltrating tumors (Stages B-2, C and D). Clinically the grading of bladder tumors according to Broders' classification has had less prognostic significance than staging. This applies particularly to chemotherapy and radiotherapy[4,11] of high grade tumors which, because of their accelerated metabolism are more responsive to these methods.

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Results of Reported Series

Results of Total Cystectomy and Supervoltage Irradiation Therapy, Alone or Combined

The results and complications of the radical treatment of invasive cancer of the bladder in several large series of cases have been averaged in Table 2. The five-year survival rate following cystectomy for stage B_2 or C carcinoma is 13 per cent. If survival rate is based solely on preoperative clinical staging, as reported by Whitmore,[15] the five-year cure figure becomes 16 per cent, a yield remarkably close to the 17.7 per cent five-year survival reported in collected series after radical supervoltage teletherapy. Thirty-eight per cent of high stage tumors treated by supervoltage irradiation alone can be expected to show complete local regression by cystoscopic and clinical assessment, but the five-year survival rate (17.7 per cent) and the surgical specimens found completely free of tumor after irradiation and cystectomy (19.5 per cent) suggest that there is still residual tumor in about half of the cases of apparent early cures after irradiation.

During the last five years, several centers have combined irradiation and surgical operation in an attempt to improve the results of treatment of advanced bladder tumors. No five-year survival figures of statistical importance are available at this time. The method involved a preoperative dose of irradiation of 5,000 to 7,000 r to the tumor, and then, following a period of four to eight weeks to allow tissue recovery, definitive surgical procedures. The principal theoretical aim of radiotherapy was to render less viable the tumor cells that are freed at the time of operation. However, an increased mortality rate has been reported to result from cystectomy following curative (6,000 r) doses of irradiation to the bladder (Table 2). Many investigators have reported a disturbingly high incidence of complications following irradiation, but specific data are not available. In our own series of 12 patients treated with combined high dosage supervoltage irradiation and surgical operation, there were 25 major complications and three deaths. The complications consisted primarily in anastomotic dehiscences and delayed or imperfect wound healing.

Chemotherapy

Many of the chemotherapeutic agents have been tried systemically or by regional infusion or perfusion techniques. With the exception of thio-TEPA used topically, there is little evidence that alkylating agents are effective. Antibiotics and plant alkaloids have also proved disappointing. Among the antimetabolites the pyrimidine analog 5-fluorouracil (5-FU) has shown the greatest promise. It has been used both systemically (by either rapid or slow infusion technique) and as a regional perfusate. Uracil has been reported to be concentrated in a number of carcinomas and is an important part of ribonucleic acid (RNA). 5-fluorouracil is incorporated in RNA in preference to uracil and is believed to promote some of its antitumor action in this manner. Primarily, 5-fluorouracil inhibits formation of thymine (and DNA) by blocking the enzyme thymidylic synthetase which controls the addition of the methyl group to uracil (as deoxyribonucleotide).[9] This alters the RNA DNA ratio by causing "unbalanced growth."

TABLE 1.—*Staging of Tumor of the Bladder Wall according to Jewett and modified by Whitmore and Marshall*

Stage O	Tumor limited to mucosa
Stage A	Tumor not beyond submucosa
Stage B_1	Tumor not more than halfway through muscle
Stage B_2	Tumor more than halfway through muscle but not metastatic
Stage C	Tumor beyond muscle but not metastatic
Stage D_1	Tumor metastatic to points within the confines of the pelvis
Stage D_2	Tumor metastatic to points outside confines of the pelvis

In 47 cases of bladder carcinoma treated with systemic 5-fluorouracil alone, reported in collected series, 30 per cent of patients experienced clinical remission and shrinkage of the tumor mass for at least two months. Admittedly, tumor regression is often short-lived and there is no evidence that 5-fluorouracil alone is curative.

Ansfield,[1] in reporting on 1,091 patients, observed a 2 per cent mortality rate during treatment. The major untoward effects resulting from 5-fluorouracil therapy occurred in the hematopoietic system and the alimentary tract. Usually, the first manifestations to occur were anorexia and nausea, followed by diarrhea and stomatitis. The most serious manifestations of toxicity in addition to intractable diarrhea were those resulting from myelosuppressive properties of the chemotherapeutic agent.

Because of our discouraging experience with the preoperative use of high doses of supervoltage irradiation, and in recognition of the previously reported synergism of 5-fluorouracil and cobalt-60 chemotherapy, we decided to institute a program of combined chemotherapy and supervoltage irradiation in an effort to contain growth of tumors and minimize postoperative complications.

5-fluorouracil and Concomitant Supervoltage Irradiation Combination Therapy

The reported experience of combination therapy for bladder carcinoma is limited. Of 40 cases re-

TABLE 2.—*Results of Radical Therapy in Treatment of Bladder Cancer*

	Cystectomy (Simple or Radical)		Radical Supervoltage Teletherapy		Preoperative Supervoltage Teletherapy and Cystectomy	
	Per Cent	No. Cases	Per Cent	No. Cases	Per Cent	No. Cases
5-year survivals, Stage B_2 or C (surgical staging)	13	259				
5-year survivals, Stage B_2 or C (clinical staging)	16	145	17.7	79		
Mortality from therapy	11.5	1047	4.6	453	18.4	98
Major complications of therapy	37	316	19	603	High	
Tumor free at cystoscopy			38	304		
Tumor free at operation					19.5	72

TABLE 3.—*Complications of Combined Cobalt-60 and 5-Fluorouracil (32 Patients)*

	Cases	Per Cent
Severe complications—		
Diarrhea, dehydration	1	3
Hematuria, requiring transfusion	4	12
(due to disease or treatment?)		
Mild complications—		
Diarrhea	16	50
Nausea	16	50
Dysuria	6	19
Vomiting	6	19
Stomatitis	2	6
Erythema	1	3
No complications	8	25
Lowest recorded leukocyte count (per cu mm)—		
Greater than 5,000	15	47
4,000 to 5,000	10	32
3,000 to 4,000	7	22
2,000 to 3,000	0	(Leukopenia)

ported by Woodruff,[16] 29 were suitable for evaluation of the early response to combined therapy. Nineteen patients (65 per cent) had objective regression of tumor. Of six patients with stage B tumors reported by Woodruff, three are tumor-free four to 10 months after treatment.

The Present Study

Commencing in 1961 a program of concomitant 5-fluorouracil (5-FU) and supervoltage irradiation therapy was instituted with the initial aim of preparing patients for cystectomy. Since that time, 32 patients have been treated. As the study progressed, the patients were divided into two groups: those treated with an average total dose of 4,000 mg of 5-FU and 3,000 r of cobalt-60 followed by operation, and those who had stage D bladder tumors or who refused operation. In the latter cases an average total dose of 6,000 mg of 5-FU and 5,500 r of cobalt-60 teletherapy were used. The treatment schedules for the two groups are outlined in protocols A and B.

Protocol A

5-fluorouracil was administered, 7.5 mg per kg of body weight by direct rapid intravenous injection daily for four days, then three times weekly until cobalt-60 teletherapy was completed (average total dose: 4,000 mg of 5-FU).

Cobalt-60 treatment was given at 2,000 to 4,000 r, fractionated as 300 r skin dose per treatment for three weeks, five days a week.

TABLE 4.—*Results of Combined Therapy*

	Treatment Group					
	I	*II*	*III*	*IV*	*V*	*Total*
Stage—						
O					1	1
A	1			1*		2
B_1	2	2				4
B_2	3	4				7
C	3					3
D_1			3	2	1*	6
D_2			3	1		4
Total cases	9	6	6	4	2	27
Tumor regression—						
Complete	5	4	1			10
Partial	4		2			6
None			2	4	2	8
Unknown		2	1			3
Surgery—						
Cystectomy	8			1	1	10
Partial cystectomy				1		1
Transurethral resection	1				1	2
Exploration (at 3000 r)			3			3
Major surgical complications	2			1	(death)	3
No tumor in specimen	5					5
Follow-up (months)—						
Duration	4-21	4-24	5-32		4-21	
Average (of survivors)	16.3	14.5	13.0	16	12.5	14.9
Present status—						
Tumor free, alive	8	4		1	2	15
Alive with tumor			2			2
Asymptomatic, status unknown		2	2			4
Died of cancer			2	3	(1 Surg.)	5
Died, other causes	1					1
Per cent surviving	89	100	67	25	100	78
Late complications—						
Stricture ureterosigmoid anastomosis	1		1			2

* Tumors secondary to carcinoma of renal pelvis.

Surgical operation (usually cystectomy) was performed six weeks after completion of 5-FU and cobalt-60 therapy.

Protocol B

5-fluorouracil was administered, 7.5 mg per kg of body weight intravenously for three days, then two times weekly for seven to eight weeks (average total dose 6,000 mg).

Cobalt-60 teletherapy was given at 5,000 to 6,000 r at 200 to 300 r (skin dose) per treatment for seven to eight weeks.

The usual loading dose of 15 mg of 5-FU per kg of body weight was found to be too toxic for use in combined therapy and the lower 7.5 mg per kg dose was adopted, as advocated by Ottoman.[12]

Treatment procedure for cobalt-60 therapy was as follows: Theratron unit, 75 cm TSD (target skin distance), 11 mm HVL (half value layer).

All patients had carcinoma of the bladder proved by biopsy. Most of them had had previous unsuccessful surgical treatment. All had tumors that were easily demonstrable cystoscopically. Bimanual examinations were done just before treatment was begun. Intravenous urograms and x-ray studies of the chest and bones were done in all cases, and in many cases cystograms as well. White blood cell counts were obtained before each 5-FU treatment. In addition the numbers of platelets were determined frequently by examination of peripheral blood specimens. If the leukocyte count fell below 4,000 per cu mm, 5-FU was withheld until it returned to 5,000, but cobalt-60 teletherapy was not interrupted.

Complications of Combination Therapy

Of the complications shown in Table 3, only five could be considered serious. One patient required treatment in hospital for dehydration secondary to diarrhea, and four patients required blood transfusions for severe hematuria, which was not necessarily a complication of therapy. Nausea and vomiting were usually controlled with antiemetic agents, and paregoric and bismuth usually alleviated diarrhea. Severe cases of diarrhea required interruption of therapy. In most of the cases in which 5-FU therapy was permanently discontinued, intractable diarrhea was the reason. Leukopenia did not occur in any of the patients. Stomatitis occurred twice, but alopecia was not noted.

Results in 27 Cases Treated Since 1961

Four patients have completed combination therapy too recently for evaluation and in an additional patient 5-FU was discontinued early in therapy because of intractable diarrhea. Complications but not results in these five patients, are included here. All five are living and well. The remaining 27 patients are divided into five groups. Results of treatment in these groups are shown in Table 4. Two cases of superficial bladder tumors are included even though combination therapy was aimed primarily at invasive bladder cancer showing muscle involvement. Group I comprised nine patients with stage A to C tumors who had had no previous radiotherapy and who were treated according to protocol A. Five of these nine patients were found to have no demonstrable tumor in the surgical specimen. Two additional patients, graded at the time of exploration and preliminary urinary diversion, showed downstaging of their tumors at the time of cystectomy.

TABLE 5.—*Results of Combined Therapy Groups III, IV, V*

(Average Followup 15 Months)

Group III—Stage D:	
Cases	6
Objective regression	3
Asymptomatic, may be tumor free	2
Alive with cancer	2
Died of cancer	2
Group IV—Previous irradiation (3 Stage D, 1A):	
Cases	4
Objective regression	0
Subsequent operation	2
Died postoperatively	1
Died of cancer	2
Alive, tumor free	1
Group V—Special Cases:	
Papillomatosis	1
Cancer secondary to renal pelvis	1
Objective regression	0
Subsequent operation	2
Alive, tumor free	2

Group II consisted of six patients who, although theoretically curable by extirpative operation, either refused operation or were considered unsuitable surgical risks. All of these patients were alive and well at the time this report was prepared (four to 24 months after commencement of combination therapy). Four of them were apparently tumor-free on repeated cystoscopic examinations and two patients refused cystoscopy but were symptom-free.

Group III comprised six patients, all with stage D bladder carcinoma without a history of previous irradiation. None of these patients was treated by cystectomy. Two of this group died of the disease.

Group IV was made up of four patients who had been treated previously with radiotherapy to the bladder. Three of these patients died as a result of the disease.

Group V consisted of one patient with papillomatosis and one with tumor secondary to cancer of the renal pelvis. In neither case did the tumor respond to treatment but both patients were alive and well after surgical treatment.

Fourteen patients were operated upon through abdominal incision (cystectomy in ten cases) follow-

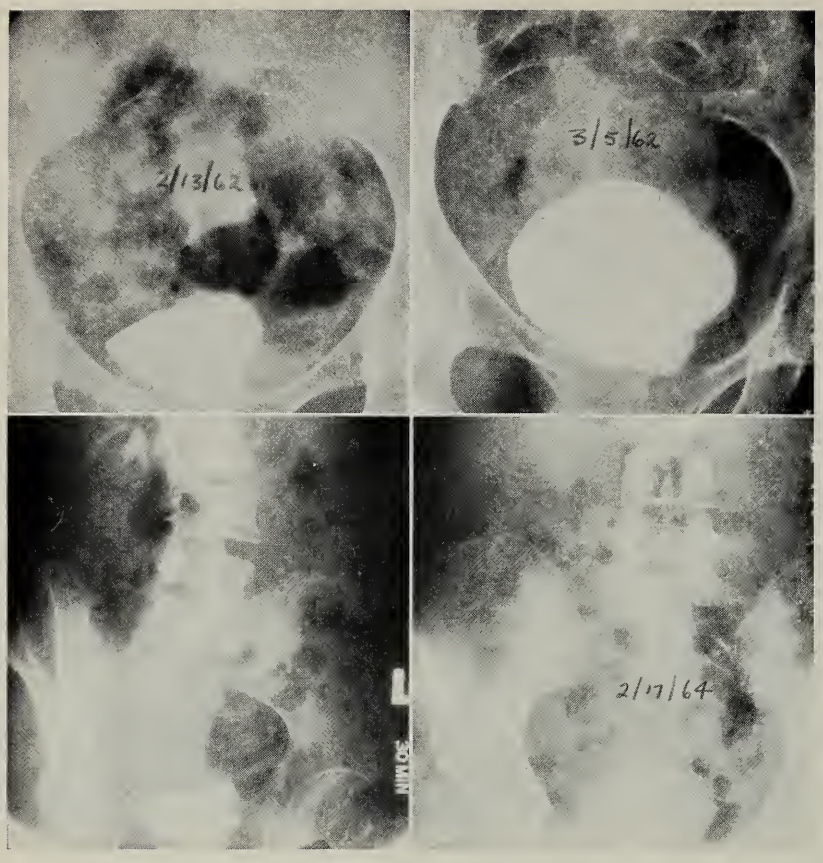


Figure 1. — *Upper left,* cystogram showing tumor on left wall of bladder. *Upper right,* cystogram after 1,956 r cobalt-60 teletherapy and 3,654 mg 5-FU. *Lower left,* cystogram eight months later shows tumor regrowth. *Lower right,* 15 months after second course of therapy, consisting of 4,031 r cobalt-60 and 2,600 mg of 5-FU. Bladder contour is essentially normal.

ing treatment according to Protocol A. Three major complications occurred: one pelvic abscess, one transient ureterosigmoid anastomotic leak, and one death in a patient (who had had extensive radiotherapy before treatment according to Protocol A) owing to a complete anastomotic breakdown after cystectomy and ureteroileocutaneous conduit procedure for stage D_1 squamous cell carcinoma.

Figures 1, 2 and 3 illustrate radiographic findings before and after treatment in four patients.

Reports of Cases

A 50-year-old Caucasian woman had a solid infiltrating tumor of the dome of the bladder first diagnosed in July 1959. The diagnosis on the basis of biopsy, bimanual examination and cystographic evidence was: transitional cell carcinoma, grade III, stage B_2. In July 1959, partial cystectomy was performed. The patient was then symptom-free until January 1962, at which time hematuria recurred. A solid tumor approximately 4 x 4 cm was found occupying the left wall of the bladder (Figure 1). Biopsy showed it to be a transitional cell carcinoma, stage B_2, grade III. The patient was treated with combination 5-fluorouracil and cobalt-60 therapy, receiving 1,956 r tumor dose of cobalt-60 in 12 treatments over a 16-day period, delivered through anterior ports only. Concomitantly she received 3,654 mg of 5-fluorouracil in nine doses, given by rapid intravenous injection. A remarkable regression of the tumor was noted while the patient was under treatment, and at the time therapy was completed the mass could no longer be identified on bimanual examination. A cystogram made at this time showed significant regression of the tumor (Figure 1). The patient was lost to follow-up for

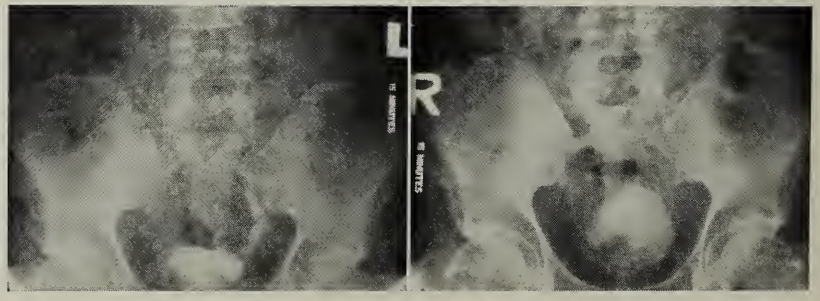


Figure 2.—*Left,* intravenous urogram showing gross distortion of the bladder by tumor. *Right,* essentially normal bladder contour after treatment according to protocol B.

eight months, and then reported because of recurrence of gross hematuria and dysuria. Cystoscopic examination again showed a large tumor occupying the left wall of the bladder, and it was palpable on bimanual examination. An intravenous pyelogram showed a filling defect (Figure 1). Because of the remarkable previous response to combination therapy, another course of treatment was given. This consisted of 4,031 r tumor dose of cobalt-60 and 2,600 mg of 5-fluorouracil, the patient receiving 18 cobalt-60 treatments and seven injections of 5-fluorouracil over a 34-day period. The dose of 5-fluorouracil was limited because of diarrhea. At this time the leukocyte count was 3,100 per cu mm. When last observed, 15 months after the second course of combination therapy, the patient was tumor-free on cystoscopic examination. A cystogram made 15 months after treatment showed an essentially normal bladder contour (Figure 1).

Figure 2 shows a filling defect in the bladder (in another patient) which regressed following combination therapy. At operation, this patient had metastatic lesions in the para-aortic nodes. He was alive, but not tumor-free, at the time of last report, ten months following treatment.

Figure 3 shows intravenous urograms made in another case before combination therapy. The intravenous urogram shows left hydronephrosis secondary to bladder tumor in the region of the left ureteral orifice. Following treatment, the hydronephrosis improved and the tumor was no longer visible cystoscopically.

Figure 4 shows intravenous urograms in which right hydronephrosis and a filling defect in the right side of the bladder are visible. Both lesions were significantly improved after treatment by Protocol A. When cystectomy was done, no tumor was found in the pathological specimen.

Discussion

The five-year cure rate of stages B_2 or C cancer of the bladder treated by radiation therapy alone is 17.7 per cent and by cystectomy alone is 16 per cent, based on clinical (not surgical) staging. It is reasonable to assume that if these two equally successful approaches can be combined without in-

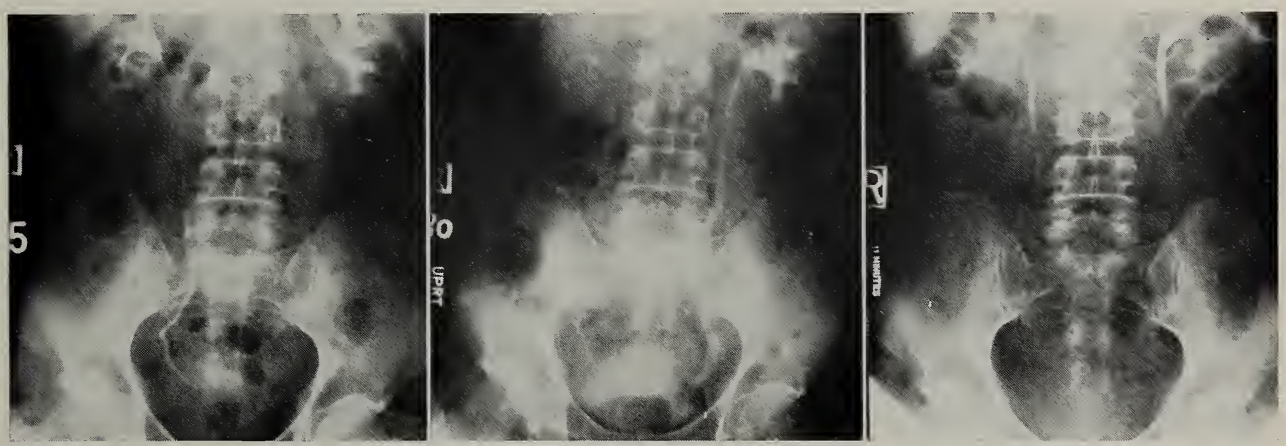


Figure 3.—*Left and center,* intravenous urograms showing left hydronephrosis. *Right,* improvement of hydronephrosis after treatment under protocol B.

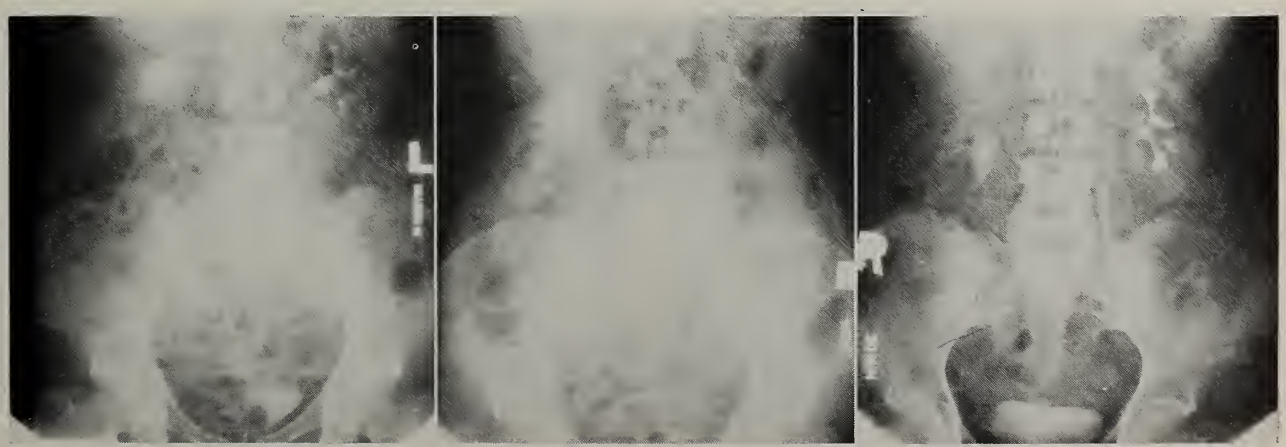
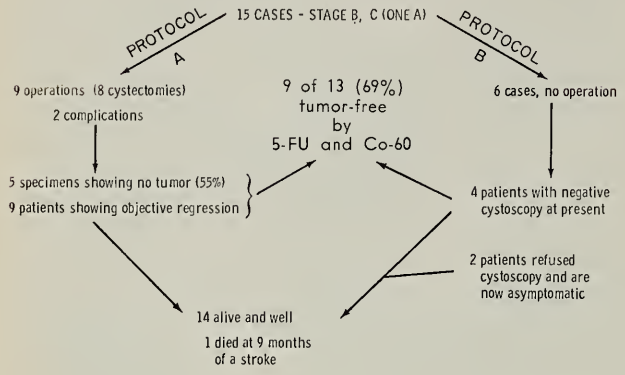


Figure 4.—*Left and center,* intravenous urograms showing right hydronephrosis and a filling defect, right wall of bladder. *Right,* intravenous urograms after treatment according to protocol A, showing reduction in hydronephrosis and improvement in bladder contour.

CHART 1.—*Results of Combined Therapy (potentially curable cases)—Groups I and II.*

(Average Followup 15 Months)



creasing morbidity and mortality, superior results should be obtained. In this preliminary report it is not possible to compare five-year survival rates after combination therapy with those reported for individual therapeutic methods. However, of 13 patients with infiltrating bladder carcinoma and no demonstrable metastasis, nine have shown no evidence of residual tumor either in the surgical specimen (five cases) or on repeated cystoscopic evaluations (four cases). These results, shown in Chart 1, compare favorably with results after supervoltage radiation alone (38 per cent apparently tumor-free and 19.5 per cent of surgical specimens showing no tumor). In addition, the surgical complication rates after treatment by 5-fluorouracil and cobalt-60 teletherapy were significantly lower than those seen following supervoltage therapy alone in high dosage. Indeed they were as low as can be expected from surgical operation alone.

We believe that definite advantages have been achieved by the combination chemotherapeutic-radiotherapeutic regimens employed. Early results are encouraging and absence of serious complications either from the combination therapy itself or from the surgical procedures following combination therapy have been gratifying.

Our experience shows that in some cases stage D carcinoma (50 per cent) will respond favorably to combination therapy and satisfactory palliation is obtained (Table 5). However, patients who have already received maximal radiation therapy respond poorly to combination treatment (Table 4). Previous irradiation therapy causes endarteritis and poor oxygenation of the bladder and its contiguous structures, and these conditions reduce the efficacy of 5-fluorouracil and additional irradiation therapy. Poor responses were also encountered in two patients with special tumors of the bladder, namely, papillomatosis and a tumor secondary to renal pelvic carcinoma.

ADDENDUM: Since the manuscript for this paper was submitted, 28 additional patients have been treated and follow-up observations have been extended. The results continue to show promise of being superior to those obtained by other methods of treatment. Cystectomy has been performed in 16 patients after treatment according to Protocol A. No tumor was found in the surgical specimens in 7 patients, tumor shrinkage was seen in 6 cases and in 3 cases there was no response. There is no evidence of tumor recurrence in 9 patients at risk 10 to 28 months (average 20 months). In 7 patients with stage B carcinoma treated according to Protocol B who had no definitive operation, there has been tumor disappearance in 5, and no tumor recurrence has been encountered in these cases over an average follow-up period of 17 months. One patient living and well at 12 months has refused cystoscopy and one patient had a small grade I papillary tumor at 6 months. Originally this patient had grade IV, stage B2 carcinoma. Of 10 patients with stage D carcinoma who were treated according to Protocol B, 5 have had an inexorable downhill course, 2 patients showed subjective and objective improvement but died at 10 and 12 months, and in 2 cases there is no demonstrable tumor at 5 and 11 months after treatment. The morbidity attending operation and the complications associated with the combined therapy have remained low and untroublesome.

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REFERENCES

1. Ansfield, F. J., Schroeder, J. M., and Curreri, A. R.: Five years clinical experience with 5-fluorouracil, JAMA, 181:295-299, 1962.

2. Bowles, W. T., and Cordonnier, J. J.: Total cystectomy for carcinoma of the bladder, J. Urol., 90:731-735, 1963.

3. Brice, M., Marshall, V. F., Green, J. L., and Whitmore, W. F., Jr.: Simple total cystectomy for carcinoma of the urinary bladder, Cancer, 9:576-584, 1956.

4. Cuccia, C. A., Jones, S., and Crigler, C. M.: Clinical impressions in 100 consecutive cases of carcinoma of the urinary bladder treated by supervoltage, J. Urol., 79:99-109, 1958.

5. Deren, T. L., and Wilson, W. L.: Use of 5-fluorouracil in treatment of bladder carcinomas, J. Urol., 83:390-393, 1960.

6. Foye, L. V., Jr., Willett, F. M., Hall, B., and Roth, M.: The potentiation of radiation effects with 5-fluorouracil, Calif. Med., 93:288-290, 1960.

7. Glenn, J. F., Hunt, L. D., and Lathem, J. E.: Chemotherapy of bladder carcinoma with 5-fluorouracil, Cancer Chemother. Rep., 27:67-69, 1963.

8. Guttman, R., and Bauza, A.: The treatment of advanced carcinoma of the bladder, Radiology, 77:465-471, 1961.

9. Heidelberger, C.: Biochemical mechanisms of action of fluorinated pyridimine, Exp. Cell. Res. Suppl., 9:462-571, 1963.

10. Jewett, H. J.: Carcinoma of the bladder: diagnostic appraisal and choice of treatment, J. Urol., 86:572-582, 1961.

11. Miller, Lowell: Personal communication.

12. Ottoman, R. E., Langdon, E. A., Rochlin, D. B., and Smart, C. R.: Side-effects of combined radiation and chemotherapy in the treatment of malignant tumors, Radiology, 81:1014-1017, 1963.

13. Riches, E. W.: Surgery and radiotherapy in urology; The bladder, J. Urol., 90:339-350, 1963.

14. Wallace, D. M.: Tumors of the Bladder, E. & S. Livingstone Ltd., London, 1959.

15. Whitmore, W. F., Jr., and Marshall, V. F.: Radical total cystectomy for cancer of the bladder: 230 consecutive cases five years later, J. Urol., 87:853-868, 1962.

16. Woodruff, M. W., Murphy, W. T., and Hodson, J. M.: Further observations on the use of combination 5-fluorouracil and supervoltage irradiation therapy in the treatment of advanced carcinoma of the bladder, J. Urol., 90:747-758, 1963.

California Chiropractors

An epidemiological study of causes of death among them and other characteristics

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■ *Records of deaths among California chiropractors in a five-year period were studied to ascertain causes of death and other characteristics—especially because of the author's interest in ascertaining whether leukemia and other deleterious effects of ionizing radiation could be observed among this occupationally-exposed group.*

The findings do not permit a conclusion that the mortality experience of California chiropractors differs substantially from that of a similar population of non-chiropractors, but the finding of 1.68 times the expected leukemia mortality is in accord with previous studies which show increased leukemic mortality among populations which have had unusually great exposure to ionizing radiation.

The finding that only 3 per cent of the death certificates of California chiropractors were signed by other chiropractors, and that 56 per cent were signed by doctors of medicine indicates that very few chiropractors seek diagnosis and treatment from other chiropractors when seriously or terminally ill.

SINCE IONIZING RADIATION was first implicated as a cause of human leukemia, more than fifty years ago,[24] epidemiological studies of human populations which have suffered occupational,* therapeutic[1,22] or nuclear bomb[10,17] exposure to radiation, in addition to experimental animal studies[11,12,14] have repeatedly affirmed the leukemogenic effects of ionizing radiation. However, significant defects in the methods of some of these studies,[21] in addition to the difficulties inherent in attempting to relate cause and effect when separated by a very long latent interval, and the low leukemia attack rates even in heavily irradiated populations, leave substantial defects in present knowledge of the relation of exposure to ionizing radiation and the twentieth century rise in leukemia.[18] Furthermore, there is a growing appreciation that leukemia and other malignant neoplasms are but a part of the total manifestation of radiation damage[2,4,19]; and that therefore studies of irradiated and control populations should include the determination of all causes of death and total mortality rates.

Accurate measurement of total deleterious so-

*Reference Nos. 9, 13, 15, 16, 21, 23-25.

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matic effects of ionizing radiation can only be achieved by observing large populations of organisms with known radiation exposure, and highly comparable but non-irradiated control populations, for the remainder of their lives. Such exact measurement is difficult for short-lived populations of experimental animals which can be exposed and manipulated according to the will of the investigator[11, 12]; it is impossible for humans. Improvement in our knowledge of effects of ionizing radiation upon humans will therefore probably continue to depend largely upon imperfect studies of a variety of groups which have inadvertently received unusually great exposure to ionizing radiation. One such group, not previously studied to the author's knowledge, is chiropractors—many of whom use x-rays, including fluoroscopy, in their practices despite little training.[5]

The study of California chiropractors reported here resulted from a combination of interest and opportunities—interest first in ascertaining if leukemia and other deleterious effects of ionizing radiation could be observed among this occupational group, and second, in performing the study as an exercise in epidemiology; and the opportunity to perform the study because of the large number of chiropractors residing in California, the inward tide of their migration, and the availability of necessary assistance.*

Method of Study

Inquiry was made of the California State Board of Chiropractic Examiners, Sacramento, concerning the availability of a list of all California chiropractors, with accompanying data such as address, age, sex, duration of practice, whether the chiropractor used x-ray, and whatever else was known concerning deceased chiropractors. The secretary of the Board replied that due to limited clerical assistance the Board was unable to supply such data. Further inquiry, however, revealed that the Board of Chiropractic Examiners, in accord with requirements of the 1922 Initiative Act, did publish an annual report to the Governor of the State, along with a "Directory of Doctors of Chiropractic".[8]† Directories in the University of California (Berkeley) library were consulted and, because of such considerations as the size and stability of population and availability of successive directories, the 4,258 chiropractors licensed to practice chiropractic in California and residing in the state as of June 30, 1950, were selected as the cohort for this study.

Each subsequent directory, 1951-1956, was studied and, with the assistance of the Chronic Disease Bureau and the Vital Statistics Division of the California State Department of Health, a thorough search was made for a death certificate whenever a chiropractor was listed as deceased, or as having forfeited his license or failing to renew it for an unstated reason. Photostat copies were obtained of the death certificates. Whenever multiple death certificates were found in the Death Indexes with names identical or very similar to that of a chiropractor failing to renew his license, photostat copies of the death certificates of all persons with similar names were obtained. The death certificate for a member of the cohort was then chosen on the basis of name, address, age and occupation or usual business. When multiple death searches in Berkeley and Sacramento failed to locate the death certificate of a chiropractor listed as deceased in the directories, inquiry was made of the local registrar. By this means several additional certificates were found—one in Colorado and two in Arizona. The names, addresses and year of death of the remaining nine chiropractors listed as deceased during the period June 30, 1950 to June 30, 1955, but for whom no death certificates were found in California, were sent to the Vital Statistics Divisions of the Colorado, Arizona and Nevada State Health Departments, with requests for search of death records for those states; which was done with negative results. These nine chiropractors probably died elsewhere than California, Colorado, Arizona and Nevada, or were registered under different names than those used in the directories.

Age and sex distributions of the cohort were ascertained by submitting a 5 per cent random sample of the June 30, 1950 (cohort) listing to the office of the Board of Chiropractic Examiners, Sacramento, which supplied the year of birth and sex for each of the 215 chiropractors listed.

Data from photostat copies of death certificates were transferred to and analyzed by means of marginal punch cards.

Mortality rates were calculated by standard methods, using the cause of death code numbers entered upon the death certificates by the California State Department of Health.

Mortality for this cohort for various causes was then compared with expected mortality for a United States, 1951, population of similar age, race, and sex composition.[7]

Findings

Characteristics of the Cohort. Variations in the number of chiropractors licensed to practice in California and their distribution according to residence and status of practice are presented in Table 1. In

*Dr. John Dunn, Dr. Lester Breslow and Mr. George Linden, California State Health Department, and Dr. William Reeves, professor of epidemiology, University of California, provided vital assistance for this study.

†Until 1950 these Directories were published sporadically; since then, annually.

TABLE 1.—*Status of Practice of California-Licensed Chiropractors Residing in California, as Recorded on Application for Renewal of License as of June 30 Each Year*[5]

Status of Practice	*1925**	*1930**	*1940**	*1945*	*1948*	*1949**	*1950*	*1954*	*1955**
Licenses in good standing	1,723	2,682	3,699	4,537†	4,920	5,408	5,167	5,383†	5,428
Licentiates practicing full time				2,384	2,439		2,603	2,509	
Licentiates practicing part time				711	829		900	1,075	
Licentiates not practicing				709	722		755	877	
Licentiates residing in other states or countries				833	930		909	824	

*Status of practice figures not published for these years.[5]
†Slight discrepancy in stated numbers.

1950, of the 4,258 licentiates residing in California (the cohort), 2,603 (61 per cent) were listed as full-time practitioners, 900 (21 per cent) were listed as part-time practitioners, and 755 (18 per cent) were listed as not practicing. Although the total number of resident licentiates increased from 3,804 to 4,461 (12 per cent) during the decade 1945 to 1954, the increase in number of licentiates practicing full time was slightly less, from 2,384 to 2,509 (10.5 per cent), and from 1950 to 1954 there was a 3.6 per cent decrease in the number of such full-time practitioners.

During the five-year study period 80 (1.9 per cent) of the 4,258 licentiates residing in California as of June 30, 1950, had moved out of the state and had retained their California licenses. Meanwhile, 69 (7.6 per cent) of the 909 licentiates not residing in California as of June 30, 1950 (and therefore excluded from the study) had migrated into the state.

The approximate age and sex distribution of the cohort is presented in Table 2. Females made up 18.7 per cent of the cohort. The median age of the cohort was 48.6 years, with a range of 22 to 79 years.

Analysis of data on death certificates provides additional knowledge of the characteristics of the cohort (Table 3): A similar although slightly smaller proportion of deceased chiropractors were female (16.8 per cent), than was indicated by the information obtained for 5 per cent of the cohort (18.7 per cent female). This slight difference can be largely attributed to the lesser force of mortality for

TABLE 2.—*Age and Sex Distribution of the 4,258 Licensed Chiropractors Residing in California, June 30, 1950 (The Cohort)**

Age Groups	*Male* No.	*Male* Per Cent	*Female* No.	*Female* Per Cent	*Total* No.	*Total* Per Cent
20-24	60	1.4	20	0.5	80	1.9
25-29	200	4.7	20	0.5	220	5.2
30-34	280	6.6	40	0.9	320	7.5
35-39	320	7.5	60	1.4	380	8.9
40-44	520	12.2	100	2.3	620	14.5
45-49	620	14.6	100	2.3	720	16.9
50-54	420	9.9	160	3.8	580	13.6
55-59	340	8.0	100	2.3	440	10.3
60-64	360	8.4	60	1.4	420	9.9
65-69	160	3.8	60	1.4	220	5.2
70-74	120	2.8	40	0.9	160	3.8
75-79	60	1.4	40	0.9	100	2.3
	3,460	81.2	800	18.7	4,260†	

*As determined by age and sex of a 5 per cent random sample.
Total actually 4,258.

TABLE 3.—*Sex, Race, Marital Status and Birthplace of 227 Chiropractors Who Died During the Four Years, June 30, 1951 to June 30, 1955. (Information from Death Certificates)*

	Male No.	*Male* Per Cent	*Female* No.	*Female* Per Cent	*Total* No.	*Total* Per Cent
Race						
White or Caucasian	187		38		225	
Negro	1		0		1	
Other	1		0		1	
Marital Status at Time of Death						
Single	11	5.8	2	5.3	13	5.8
Married	140	74.1	12	31.6	152	67.0
Divorced	20	10.6	6	15.8	26	11.4
Widowed	16	8.5	18	47.4	34	15.0
Not stated	2	1.1	0		2	0.9
Birthplace of Diseased Chiropractors						
California	25	13.2	1	2.6	26	11.4
Other state	124	65.6	25	65.8	149	65.6
Other country	38	20.1	11	28.9	49	21.7
Not stated	2	1.1	1	2.6	3	1.3
Sex	189	83.2	38	16.8	227	

TABLE 4.—*Age of Last Birthday of 227 Deceased Chiropractors*

Age Groups	*Male*	*Female*	*Total*
20-24	0	0	0
25-29	0	0	0
30-34	2	0	2
35-39	5	0	5
40-44	8	0	8
45-49	12	0	12
50-54	19	5	24
55-59	36	2	38
60-64	26	4	30
65-69	35	9	44
70-74	22	7	29
75-79	16	6	22
80-84	7	4	11
85-89	2	0	2
Median age at death (years)	62.4	69.4	64.0

female chiropractors, as indicated by the greater median age at death for females (69.4) than for males (62.4 years). (See Table 4.)

Only two of the 227 chiropractors who died during the four years June 30, 1951 to June 30, 1955, and for whom death certificates were found, were non-white (one was negro, the other oriental). Hence the mortality experience of the cohort will be compared with that of a white population.

Eleven per cent of the cohort were born in California, 66 per cent were born in another of the United States, 22 per cent were born in another country, and place of birth was not indicated for 1 per cent.

One hundred and fifteen (51 per cent) of the 227 death certificates for chiropractors listed chiropractic as the usual occupation of the deceased. In addition, chiropractic was listed as the "Kind of Business" upon 41 of 55 death certificates which indicated the "Usual Occupation" of the deceased as doctor or physician; and upon five of the 57 certificates which indicated the "Usual Occupation" of the deceased as something other than chiropractor or doctor. Many other occupations were listed as the "Usual Occupation" of the remaining deceased chiropractors, identified as members of the cohort by name and address (Table 5).

TABLE 5.—*"Usual Occupation" as Stated on Death Certificates*

	Male		Female		Total	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
Chiropractor	102	54.0	14	37	116	51
Doctor*	45	23.8	10	26	55	24
Other†	38	20.1	14	37	52	23
Not stated	4	2.1	0		4	2
	189	100	38	100	227	100

*Chiropractic was indicated as the "Kind of Business" upon 41 of the 55 certificates which indicated the "Usual Occupation" as Doctor or Physician.

†Chiropractic was indicated as the "Kind of Business" upon five of the 55 certificates which listed the "Usual Occupation" as something other than Chiropractor or Doctor. Other occupations listed as "Usual Occupation" were: housewife (10), salesman (4), unknown (4), postal worker (2), dentist (2), guard (2), realtor (2), optometrist (2), osteopathic physician (2), and accountant, purchasing agent, district building manager, drugless therapist, carpenter, practical nurse, engineman, dishwasher, school teacher, maintenance, hearing reporter, veteran, pharmacist, minister, photographer, insurance agent, real estate broker, health inspector, electrical inspector, telegrapher and boilermaker.

TABLE 6.—
Time of Death for 251 California Chiropractors

Year of Study	Time Period July 1 to June 30	Death Certifs. Found	No Death Cert. Found‡	Total Deaths by Year	Expected† Deaths by Year
1	1950-51	15*	0	15*	59*
2	1951-52	62	1	63	64
3	1952-53	58	2	60	68
4	1953-54	57	2	59	72
5	1954-55	50	4	54	75
	5 year total*	242*		251*	338*
	4 year total	227	9	236	279

*Mortality analysis largely limited to last four years of study because of apparent self-exclusion from the cohort of chiropractors with disabling or terminal illness.

†Expected according to the experience of a 1951 U.S. population of similar size, age, sex and race.[7] Annual midyear population at risk calculated by appropriate subtraction of known deaths and age shift of population. Effects of aging more than offset the decrease in population at risk due to mortality.

‡Additional chiropractors listed as deceased, but no death certificate found.

Mortality Analysis

During the study period June 30, 1950 to June 30, 1955,, 599 (14 per cent) of the 4,258 members of the cohort failed to renew their licenses. Death certificates were found for 201 of the 206 members of the cohort who were listed as deceased in the directories, and for 33 of the 216 members of the cohort listed as having forfeited their licenses, for unstated reasons. In addition, as a further check, each name of the 4,258 members of the cohort listed in the 1951 directory was checked against the chiropractors licensed as of June 30, 1955, listed in the 1956 directory. By this means the unexplained absence of 177 members of the cohort was discerned. Search for these 177 chiropractors yielded eight additional death certificates. Altogether, death certificates were found for 242 members of the cohort, who died during the five years from June 30, 1950 to June 30, 1955. The distribution of these 242 deaths during the study period (Table 6) is rather clear evidence that many chiropractors with terminal and disabling illnesses were self-excluded from the licentiate cohort: Only 15 of the cohort died during the first year, whereas about 60 deaths would have been expected, according to national experience and subsequent experience of the cohort. On the other hand the total annual distribution of deaths during the five-year study period—15, 62, 58, 57, 49—indicates that the effects of self-exclusion from the cohort because of failing health were largely limited to the first year. Therefore, the definitive mortality analysis is limited to the 227 deaths occurring during the last four years of the study.

Seven (3.1 per cent) of the 227 death certificates of deceased chiropractors were signed by other chiropractors (Table 7a and 7b).* The majority, 126 (55.5 per cent) were signed by doctors of medicine; 67 (29.5 per cent) were signed by coroners; and 27 (11.9 per cent) were signed by osteopathic physicians.

None of the seven deceased chiropractors whose death certificates were signed by other chiropractors was examined postmortem. Autopsy was done on the bodies of 38 (30 per cent) of the 127 whose

*In California chiropractors are legally permitted to certify cause of death for their patients.[8]

TABLE 7a.—*Certification of California Deaths*

Certification by	For Chiropractors 1951-1955 No.	For Chiropractors 1951-1955 Per Cent	For All California Deaths, 1953* No.	For All California Deaths, 1953* Per Cent
Doctor of Medicine (M.D.)	126	55.5	79,140	71.9
Coroner	67	29.5	25,861	23.5
Osteopathic Physician (D.O.)	27	11.9	4,830	4.4
Chiropractor	7	3.1	187	0.2
Other or unknown	0		5	
Total	227		110,023	

*Data supplied by Bureau of Records and Statistics, California State Health Department.

TABLE 7b.—*Stated Causes of Death for the Seven Chiropractors Whose Death Certificates Were Signed by Other Chiropractors*

Deaths	Stated Cause(s)*	Interval Between Onset and Death
1.	Respiratory failure*	2 hours
	Post bulbar poliomyelitis†	2½ weeks
2.	Congestive heart disease*	5 days
	Cardiac hypertrophy†	10 years
3.	Coronary occlusion*	1 hour
4.	Coronary occlusion*	
	Coronary sclerosis†	
5.	Massive anterior myocardial infarction*	1 month
	Sinus tachycardia†	
6.	Atypical virus pneumonia*	2 weeks
	Senile natural causes†	2 years
	Anemia‡	10 years
7.	Coronary occlusion*	
	Arteriosclerosis†	

*Disease or condition directly leading to death.
†Contributory and ‡antecedent causes.

death was certified by M.D.'s of 32 (48 per cent) of those certified by coroners, and five (18 per cent) of those certified by osteopathic physicians.

Ninety-nine (43.6 per cent) of the 227 deceased chiropractors died in medical hospitals. Sixteen (7.0 per cent) died in other institutions such as nursing homes, mental institutions, osteopathic hospitals and chiropractic sanitariums. The remaining 49.4 per cent died elsewhere—home, hotel, street and the like.

Observed and expected mortality of the cohort during the four years June 30, 1951 to June 30, 1955, from leukemia, all malignant neoplasms, arteriosclerotic heart disease including coronary disease, all other causes, and from all causes is presented in Table 8 and Chart 1.

Three deaths from leukemia were observed, which was 1.68 times the 1.78 deaths expected from leukemia.† The three leukemia deaths were all ascribed to lymphatic leukemia, two chronic and one acute. The stated interval from onset to death was two months for the chiropractor dying of acute lymphatic leukemia, 13 months for one with chronic leukemia and not stated for the third. In addition to the three deaths ascribed to leukemia during the last four years of the study, June 30, 1950 to June 30, 1951, one death from lymphocytic leukemia was recorded in 1950 during the first year of the study—which is omitted—and one death, in 1953, was ascribed to malignant lymphoma. Also, the certificate for one death ascribed to coronary occlusion, in 1954, mentions polycythemia as a contributing cause.

Thirty-four deaths from all malignant neoplasms were observed, which was 0.73 times the 46.7 deaths expected from this cause. In addition to the three deaths from leukemia and one death from malignant lymphoma, eight deaths were ascribed to carcinoma of the lung and two deaths to carcinoma of the thyroid. Ninety-seven deaths from arteriosclerotic heart disease including coronary disease were observed, which was 1.12 times the 86.7 deaths expected from this cause. Four of the seven death

†The probability of a chance observation of three or more deaths from leukemia in this study population, when 1.78 deaths were expected is 0.217.

TABLE 8.—*Causes of Death of California Chiropractors (Deceased During 4 Year Period June 30, 1951 to June 30, 1955)*

Int'l List No.	Cause of Death	Observed Male	Observed Female	Observed Total	Expected* Male	Expected* Female	Expected* Total	Obs./Exp.
204	Leukemia	3	0	3	1.53	.25	1.78	1.68
140-205	All malignant neoplasms	26	8	34	37.90	8.76	46.66	.73
420	Arteriosclerotic heart disease, including coronary disease	85	12	97	77.84	8.89	86.73	1.12
	All other causes	75	18	93	118.81	21.44	140.25	.66
	Total, all causes	189	38	227	236.08	39.34	275.42	.82

*Expected according to the experience of a 1951 United States white population of similar age, sex and number.[7]

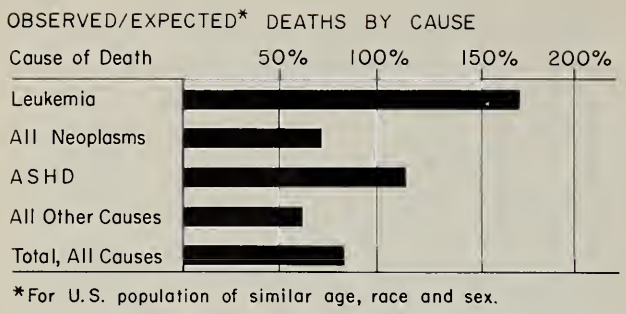


Chart 1.—Relation of number of deaths from various causes among California chiropractors to the actuarily expected number of deaths from those causes. (ASHD—Arteriosclerotic heart disease.)

certificates signed by chiropractors ascribed death to coronary disease (Table 7b). Ninety-three deaths from all other causes were observed, which was 0.66 times the 140.2 deaths expected from all other causes. Other stated causes were suicide (six)—four by means of carbon monoxide, alcoholism and cirrhosis (four), tuberculosis (three), psychosis (two), heroin poisoning (one), septicemia due to staphylococcus aureus (one), etc. In one case no cause of death was ascertained "due to advanced decomposition," and in another case the cause of death was "undetermined after gross and microscopic autopsy and toxicological study."

Altogether, 227 deaths from all causes were observed during the last four years of the study, which was 0.82 times the 275.4 deaths expected from all causes. In addition to the 227 deaths discerned by means of death certificates, nine members of the cohort, for whom no death certificates were found, were listed in the directories as deceased.

Discussion

This study was performed in retrospect, and the deaths observed among the chiropractor cohort during the study period are undoubtedly somewhat less than actual occurrence: California chiropractors are a noticeably unstable group with respect to occupation and residence, and despite intensive and multiple efforts at identifying all deceased members it is probable that some were missed because of such factors as change of name, change of occupation, or migration to another state or country. Therefore, the greater-than-expected mortality for leukemia and arteriosclerotic heart disease (Table 8 and Chart 1) is at least as great as indicated, but the less-than expected mortality from all malignant neoplasms, all other causes and all causes is of questionable significance. The findings do not permit a conclusion that the mortality experience of California chiropractors varies substantially from that of a similar population of non-chiropractors; but the finding of 1.68 times the expected mortality from leukemia* is in accord with previous studies which show increased mortality from leukemia among populations which have had unusually great exposure to ionizing radiation. Several factors may have reduced mortality ascribed to leukemia among California chiropractors:

1. Occupational exposure of the average cohort member to ionizing radiation would have been substantially reduced by the fact that only 2,603 (61 per cent) of the 4,258 licensed chiropractors residing in California as of June 30, 1950, were in full-time practice.

2. An indeterminate, but known to be substantial, proportion of practicing chiropractors did not possess nor use an x-ray apparatus.

3. Misdiagnosis. Although doctors of medicine had certified the cause of death for 56 per cent of the deceased chiropractors studied, one may perhaps reasonably assume that the period of observation and treatment and the diagnostic examinations performed for this group of patients would have been less than average. And, certainly, one can reasonably conclude that for the 44 per cent of deceased chiropractors whose death certificates were signed by other chiropractors, or coroners who were not doctors of medicine, diagnoses were often based upon inadequate examination and knowledge. Therefore, it is not unlikely that additional chiropractors, whose deaths were ascribed to, for example, "pericardial tamponade (12 hours)," "subacute pericarditis of undetermined cause (10 weeks)," and "secondary anemia (10 weeks)," or "carcinomatosis, site undetermined," may actually have died of leukemia.

The finding that only 3 per cent of the death certificates of California chiropractors were signed by other chiropractors, and that 56 per cent were signed by doctors of medicine, is of particular interest because it provides a measure of the chiropractor's regard, or lack thereof, for the work of his colleagues. Apparently very few chiropractors seek diagnosis and treatment from other chiropractors, or are satisfied therewith, when seriously or terminally ill. Most chiropractors, like the great majority of the public and virtually all doctors of medicine, place their trust in and seek the care of doctors of medicine when seriously ill.

It is of related interest that the stated causes of death for the seven chiropractors whose death certificates were signed by other chiropractors (Table 7b) are all *medical* causes: e.g., "respiratory failure (2 hours), due to postbulbar poliomyelitis (2½ weeks)"; "massive anterior myocardial infarction (1 month), with sinus tachycardia"; and "coron-

*The probability of a chance observation of three or more deaths from leukemia in this study population, when 1.78 deaths were expected, is 0.217.

ary occlusion due to arteriosclerosis." These *medical* diagnoses, by chiropractors, are far removed from the usually stated philosophic basis of chiropractic education and practice—that all disease is due to subluxation or slight dislocation of one or more spinal vertebrae[3, 5, 6]; and one can perhaps reasonably conclude that when a chiropractor with a serious illness seeks and remains under the care of a fellow chiropractor, it is not because his colleague is an unusually able practitioner of chiropractic but, rather, it is because his colleague has learned something of medical science, as indicated by his use of medical, *not chiropractic*, terminology.

Long ago there were at least a few chiropractors who believed deeply in the chiropractic philosophy of disease causation—as indicated by their certification that a 62-year-old white male resident of Seattle died in 1921 of "Subluxation of 6-9 dorsal and 1st lumbar—causing a combination of symptoms known as 'leukemia' "; and that a 27-year-old white female resident of Seattle died in 1924 of "4D and 12D subluxations causing liver and kidney incoordination."* But as knowledge and education have advanced, such whimsical explanations of disease and death causation no longer suffice, even for chiropractors.

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REFERENCES

1. Abbott, J. D., and Lea, A. J.: The incidence of leukemia in ankylosing spondylitis treated with x-rays, Lancet, 271: 1317-1320, Dec. 29, 1956.

2. Biological Effects of Atomic Radiation, Summary Reports, National Academy of Sciences, National Research Council, Washington, D.C., 1956.

3. Brochures of the: Hollywood College School of Chiropractic, 2009 West Ninth Street, Los Angeles 6, Calif.; California Chiropractic College,† 4107 Broadway, Oakland 9, Calif.; Rest-View University of Chiropractic, Inc.,† 416 W. 125th St., Seattle, Wash.; and National Chiropractic Association, Webster City, Iowa.

4. Bugher, J. C.: Some problems of interpreting statistics on cancer diagnosis and treatment, Univ. of Mich. Med. Bull., 22:488-496, Nov., 1956.

5. Chiropractic in California: A report by the Stanford Research Institute for the Haynes Foundation, 607 South Hill Street, Los Angeles, Calif., 1960.

*These death certificates were perceived in the course of an examination of all death certificates registered in Seattle, 1881-1960.[20]

†Now defunct.

6. Cunningham, E., and Reed, L.: Guide to Earning a Living, pp. 116, Simon and Schuster, New York, 1955.

7. Deaths and death rates for 64 selected causes, by age, race and sex, United States, 1951: Vital statistics—Special Reports, National Summaries, Vol. 38, Aug. 25, 1954.

8. Directory of Doctors of Chiropractic (1926, 1946, 1949, 1951-1956): California State Board of Chiropractic Examiners, Sacramento, Calif.

9. Faber, K.: Professional roentgen anemia, Ugesk f. Laeger, 85:8-10, Jan. 4, 1923.

10. Folley, J. H., Borges, W., and Yamawaki, T.: Incidence of leukemia in survivors of the atomic bomb in Hiroshima and Nagasaki, Japan, Am. J. Med., 13:311-321, Sept., 1952.

11. Furth, J., and Furth, O. B.: Neoplastic diseases produced in mice by general irradiation with x-rays: Incidence and types of neoplasms, Am. J. Cancer, 28:54-65, Sept., 1936.

12. Henshaw, P. S.: Leukemia in mice following exposure to x-rays, Radiology, 43:279-285, Sept., 1944.

13. Henshaw, P. S., and Hawkins, G. W.: Incidence of leukemia in physicians, J. Natl. Cancer Inst., 4:339-346, Feb., 1944.

14. Krebs, C., Rask-Neilsen, H. C., and Wagner, A.: Origin of lymphosarcomatosis and its relation to other forms of leukosis in white mice, Acta Radiol., suppl. 1-53, 1930.

15. March, H. C.: Leukemia in radiologists, Radiology, 43:275-278, Sept., 1944.

16. Martland, H. S., Conlon, P., and Knef, J. P.: Some unrecognized dangers in the use and handling of radioactive substances: with especial reference to the storage of insoluble products of radium and mesothorium in the reticulo-endothelial system, J.A.M.A., 85:1769-1776, Dec. 5, 1925.

17. Moloney, W. C., and Kastenbaum, M. A.: Leukemogenic effects of ionizing radiation on atomic bomb survivors in Hiroshima City, Science, 121:308-309, Feb., 1955.

18. Moriyama, I. M.: Age-adjusted death rates, by cause, United States, 1949-1954, National Office of Vital Statistics, Public Health Service, Department of Health, Education and Welfare, Washington 25, D.C.: Personal communication.

19. Pathologic Effects of Atomic Radiation, National Academy of Sciences, National Research Council, No. 452, Washington 25, D.C.

20. Ravenholt, R. T.: Historical epidemiology and grid analysis of epidemiologic data, Am. J. Public Health, 52: 776-790, May, 1962.

21. Seltzer, R., and Sartwell, P. E.: Ionizing radiation and longevity of physicians, J.A.M.A., 166:585-587, Feb. 8, 1958.

22. Simpson, C. L., Hempelman, L. H., and Fuller, L. M.: Neoplasia in children treated with x-rays in infancy for thymic enlargement, Radiology, 64:840-845, June, 1955.

23. Ulrich, H.: The incidence of leukemia in radiologists, N.E.J.M., 234:45-46, Jan. 10, 1946.

24. von Jagie, N., Schwartz, G., and von Siebenrock, L.: Blutbefunde bei Roentgenologen, Berl. Klin. Wochschr, 2:1220-1222, July 3, 1911.

25. Warren, S.: Longevity and causes of death from irradiation in physicians, J.A.M.A., 162:464-468, Sept. 29, 1956.

Sequelae of Bacterial Meningitis in Infants

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■ *Electroencephalograms, developmental tests and intelligence tests indicated that six of ten children under two years of age who had purulent meningitis, had apparent permanent neurological damage. The data suggested that this damage may be related in part to the occurrence of subdural effusions.*

Serial electroencephalograms and developmental tests appeared useful for suggesting which patients might retain a high risk of compromised brain function.

The lack of further decrease in mortality from this disease in recent years may be because of cases in which meningitis is "secondary" to a primary disease of the central nervous system—that is, due to operation for brain tumor or myelomeningocele which affords direct entry of organisms. The incidence of permanent sequelae following this disease may not be decreasing.

ALTHOUGH DIAGNOSIS and therapy of bacterial meningitis are reasonably clear, little is known of the wastage of this disease—that is, the number who die or suffer from permanent sequelae. For light on this aspect, follow-up observation of a group of patients was maintained for two years.

Method of Procedure

Ten patients under two years of age who were treated for purulent meningitis between September 1959 and June 1960 were studied prospectively. Detailed information concerning the onset of the illness and developmental characteristics was obtained from the family and referring physician upon admission. An electroencephalogram was obtained during or at the end of the acute illness, another six months later, and a third two years later. A developmental test as devised by Gesell[8] was performed one month after the acute illness, one year following the acute illness, and, if indicated, at intervals before or after this. The Stanford-Binet Intelligence Test was performed two years following the acute illness and the parents were interviewed about developmental and behavioral characteristics. On the basis of the data obtained the patients were then rated as to present neurological state in the following manner: 0 indicated all data to be normal; 1+ indicated one or more "minor" manifestations (behavior problems,

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TABLE 1.—*Data on Ten Cases of Purulent Meningitis in Patients Under Two Years of Age (1959-1960)*

Patient	*Status 2½ Years After Illness*	*Brain Damage Rating*	*Age at Onset*	*Organism Cultured*	*Subdural Effusion*	*EEG*			*After Illness*		
						During Treatment	*After Illness*				
							Months	*Interpretation*	*Months*	*Developmental Quotient*	*I.Q.*
1.	Normal	0	2 weeks	Hemophilus influenzae	Yes, no operation	Very abnormal	1	Normal	1	100	100
							30	Normal	12	110	
2.	Normal	0	12 months	Hemophilus influenzae	No	Normal	1	Normal	1	98	
							30	Normal	12	120	96
3.	Normal	0	23 months	Hemophilus influenzae	No	Mildly abnormal	1	Normal	1	100	
							8	Normal	8	96	Refused
							30	Refused			
4.	Normal	0	8 months	Hemophilus influenzae	No	Normal	1	Normal	1	100	
							28	Normal	10	100	92
5.	Behavior problem and abnormal EEG	1+	16 months	Hemophilus influenzae	No	Normal	12	Mildly abnormal	1	106	122
									6	130	
							30	Mildly abnormal	12	100	
6.	Retarded behavior problem	2+	1 week	Hemolytic streptococcus	No	Normal	12	Normal	1	100	75
							30	Abnormal	10	100	
									21	82	
7.	Seizures, behavior problem	2+	14 months	Hemophilus influenzae	No	Abnormal	12	Abnormal	1	100	
							30	Abnormal	6	100	105
									12	110	
8.	Seizures, retarded	3+	10 months	Hemophilus influenzae	Yes, with operation	Mildly abnormal	6	Abnormal	1	100	
							12	Normal	5	73	46
							30	Abnormal	7	81	
									18	75	
9.	Decerebrate	4+	2 months	Pneumococcus	Yes, with operation	Abnormal	6	Abnormal	1	30	
							12	Abnormal	10	8	Decerebrate
10.	Decerebrate	4+	5 months	Sterile	Symptoms, but negative tap	Very abnormal	6	Abnormal	1	20	
							12	Abnormal	12	18	Decerebrate

persistently abnormal nonfocal electroencephalograms, slow development); 2+ indicated one "major" manifestation (seizures, retardation, neurological deficit) plus any minor manifestations; 3+ indicated two major manifestations plus any minor manifestations; 4+ indicated a decerebrate state.

In addition, using hospital records, the 69 cases of purulent meningitis occurring in children 16 years of age and under treated at the UCLA Hospital between 1955 and 1961 were analyzed retrospectively for age, organism and mortality.

Results

The ten cases are rated in Table 1. Four received a score of 0, one received a score of 1+, two of 2+, one 3+, and two 4+. The total incidence of apparent neurological damage, then, was six of ten.

Age. All the ten patients were under two years at the onset of disease, and the range was from one week to 23 months. In this small series no relationship could be found between the age at onset of meningitis and the severity of the sequelae.

Organism Cultured. There were seven cases of *Hemophilus influenzae*, one of pneumococcus, one of streptococcus, and one sterile (received antibiotics before admittance to hospital). Sequelae from *Hemophilus influenzae* meningitis ranged from 0 to 3+. The pneumococcal and sterile cases were the most severely affected.

Subdural Effusion. Three of the ten had positive subdural taps. In one the condition resolved with repeated taps and the patient is apparently normal today. In the other two surgical operation was necessary, and both have severe sequelae. One other patient had symptoms suggestive of effusion but subdural taps were negative. This patient became decerebrate.

Electroencephalograms. An abnormal electroencephalogram during or immediately following the acute illness occurred in six of the ten cases and was characterized by nonfocal generalized low-potential slow waves of 3 to 5 per second. In four this abnormality persisted and was associated with later evidence of brain damage, the tracings showing the same general pattern as in the acute phase. Of the four patients with normal electroencephalograms during the acute stage, two later had abnormal electroencephalograms and symptoms of mild brain damage.

Developmental Testing. Testing identified the four patients with retardation. One normal result of such testing was not enough, as two of these four patients with normal result following the acute stage subsequently had a drop in developmental quotient which persisted and was later confirmed by intelligence testing.

Intelligence Testing. Four of the nine tested had significant retardation. One family refused this testing.

Data comparing the severity of sequelae with the source of infection, interval of illness before diagnosis, treatment before diagnosis and severity of acute illness were collected but will not be presented here.

Population Characteristics. Interest in the type of population these ten patients came from led to an analysis of the total of 69 cases of childhood purulent meningitis of record at this hospital. Analysis by age and organism is shown in Table 2. The majority of patients was under two years of age, and the predominant organism was *Hemophilus influenzae*. The mortality rate for the total group was 7.3 per cent.

Discussion

The possibility, suggested in the present study, that subdural effusion has a damaging effect is supported by two other reports. McKay and coworkers[11] found retrospectively that 16 of the 18 patients in their series who had "gross neurological and mental residue" had symptoms suggestive of subdural effusion. Johnson[10] prospectively found a significant fall in intelligence quotient testing in seven of the nine patients in his series who had positive subdural taps. Since the number of cases

TABLE 2.—*Age and Organism in 69 Cases of Purulent Meningitis (1955-1961)*

Organism	*Age of Patient at Onset*							*Total Number of Patients*
	0-6 mo.	*6 mo.-1 yr.*	*1-3 yr.*	*4-6 yr.*	*7-9 yr.*	*10-12 yr.*	*13-15 yr.*	
Hemophilus influenzae	3	10	11	5	6			35
Pneumococcus	2			2	2			6
Streptococcus	3							3
Pseudomonas	1		1		1			3
Escherichia coli	1							1
Klebsiella	1						1	2
Meningococcus	1							1
Neisseria intercellularis	1							1
Unknown	6		3	1	3	2	2	17
Total	19	10	15	8	12	2	3	69

in all these studies was small, whether or not this relationship is truly causal or just associational remains obscure.

The prognostic value of developmental testing was demonstrated both in the present study and in the only other reported study[6] in which this technique was used. Its value lies mainly in suggesting which patients have a high risk of compromised brain function, and it should not be considered a final judgment.

The population characteristics in Table 2 are similar to those of other reports in the literature with the exception of the low incidence of meningococcal meningitis. The mortality rate of 7.3 per cent among the 69 patients in the present study is compared with the mortality reported in the literature (Table 3). In recent years there has not been a significant further decrease in mortality. A closer look at the deaths in this study may shed some light on this item. In four of the five fatal cases the patient had "secondary" meningitis (a primary disease of the central nervous system afforded obvious direct portal of entry for organisms) as it followed operation for brain tumor in two and complicated a myelomeningocele in two. If all the cases of "secondary" meningitis which occurred in the series are removed, then there is one death in 61 cases, or 1.6 per cent.

The incidence of permanent sequelae in this study is compared with previous reports in Table 4. The data are too diverse to draw any direct comparisons, but there is not a dramatic decline in these figures with the advent of chemotherapy such as was seen in the mortality table.

It appears, then, that the wastage of this disease, while changing in character, may remain significant and needs further investigation.

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TABLE 3.—*Mortality Rate in Childhood Purulent Meningitis (From Literature)*

Reported by	*Date*	*Mortality Rate (Per cent)*
Worster-Drought[17]	1918	50
Slesinger[15]	1933	32
Crook, et al.[2]	1941–48	21
Smith[16]	1944–54	31
Platou, et al.[13]	1951–55	15
Desmit[6]	1955	9
Carson, et al.[1]	1956	10
Johnson[10]	1960	9
Present study	1955–61	7

TABLE 4.—*Sequelae in Childhood Purulent Meningitis*

Reported by	*Date*	*Incidence of Over all Sequelae (Per cent)*	*Comment*
Batten (Cited by Worster-Drought[17]	1915	35	Infants only
Worster-Drought[17]	1918	8.3	Survivors only
Slesinger[15]	1933	36	
Degan[5]	1940	15	Survivors only
Davies[4]	1940–47	67	Survivors under 2 years
Crook, et al.[2]	1941–48	24	Survivors under 2 years
Smith[16]	1944–54	18	Retrospective
Scholz[14]	1946–51	33	Pneumococcal only
McKay[11]	1945–48	24	Hemophilus influenzae only
Daisley[3]	1950	21	Pneumococcal only
Platou, et al.[13]	1951–55	23	Survivors under 6 years
Desmit[6]	1955	14	
Dzherdzheryan[7]	1959	9	Meningococcal only
Haggerty[9]	1935–60	75	Neonates only
Present Study	1955–61	60	Under 2 years

REFERENCES

1. Carson, M. J., and Koch, R.: Management of bacterial meningitis in children, Pediat. Clin. N. Amer., 377-398, May, 1956.

2. Crook, W., Clanton, B., and Hodes, H.: Hemophilus influenzae meningitis, Pediatrics, 4:643, 1949.

3. Daisley, G.: Pneumococcal meningitis, Clin. Proc. Child. Hosp., Wash., 7:1, 1950.

4. Davies, J., Meyer, E., and Hyde, H.: Follow-up study of patients who have recovered from meningitis, Am. J. Dis. of Child., 79:958, 1950.

5. Degen, J.: Sequelae of cerebrospinal meningitis, Brit. Med. J., 2:243, 1945.

6. Desmit, E. M.: A follow-up study of 110 patients treated for purulent meningitis, Arch. Dis. Childhood, 30: 415, 1955.

7. Dzherdzheryan, S.: Catamnestic data of children who had sustained epidemic meningitis in modern modes of therapy, Pediatriia, 2:51, 1959.

8. Gesell, A., and Amatruda, C.: Developmental Diagnosis, Harper and Bros., New York, 1952.

9. Haggerty, R., and Ziai, M.: Neonatal meningitis, N.E.J.M., 259:314, 1958.

10. Johnson, E.: A study of psychological findings of 100 children recovering from purulent meningitis, J. Clin. Psychol., 16:55, 1960.

11. McKay, R., Ingraham, F., and Matson, D.: Subdural fluid complicating bacterial meningitis, J.A.M.A., 152:387, 1953.

12. Pai, N.: Personality defects and psychiatric symptoms after cerebrospinal fever in childhood: Meningococcal encephalopathy, J. Mental Sci., 92:389, 1946.

13. Platou, R., Rinker, A., and Derrick, J.: Acute subdural effusion and late sequelae of meningitis, Pediatrics, 23:962, 1959.

14. Scholz, R.: Uber das Weitere Schicksol wegen Pneumokokken-Meningitis Behandetter Kinder, Öst. Z Kinderheilk., 9:173, 1953.

15. Slesinger, H.: Complications and sequelae of meningococcal meningitis during infancy and childhood, Penn. Med. J., 36:327, 1933.

16. Smith, E.: Purulent meningitis in infants and children, J. Pediat., 45:425, 1954.

17. Worster-Drought, C.: The nervous sequelae of cerebrospinal fever, Lancet, 2:39, 1918.

Counting California's Snakebites

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■ *Poisonous snakebites happen in all sections of California, but they are especially frequent in Southern California. An estimated 221 (138 in-patients and 83 out-patients) people were bitten by snakes annually, an incidence of 1.41 bites per 100,000 people. However, the estimated case-fatality rate was less than one-half of one per cent.*

Of 135 in-patients reported in detail by California hospitals during 1958 and 1959, 123 (91 per cent) were bitten by rattlesnakes, one (1 per cent) by a foreign snake, and 11 (8 per cent) by unidentified poisonous snakes. "Seasonal epidemics" of snakebites occurred, 90 per cent of the bites being inflicted from April through October.

Males had higher bite rates than females and Caucasians had higher rates than non-whites. Fifty per cent of the cases were among children and young adults less than 20 years of age. Ninety-nine per cent of the bites were on the extremities—65 per cent on the upper extremities and 34 per cent on the lower extremities. The recommended treatment of poisonous snakebites included incision and suction and the 3 A's (antivenin, antibiotics and anti-tetanus treatment).

CALIFORNIA has an abundance of poisonous snakes —rattlesnakes. Russell[8,9] collected information about poisonous snakebites in 11 counties of Southern California and estimated that at least 60 to 70 bites happened there each year. Furthermore, 12 persons in California died of poisonous snakebites during the ten-year period 1950-1959.[3] Since snakebites seemed to be an important medical problem in California and since no reliable count of the incidence of snakebites for the entire State was available, a survey of snakebite accidents was planned. The purposes of this study were: (1) to describe epidemiologic aspects of poisonous snakebites for the entire State of California; (2) to relate some medical findings associated with these bites; and (3) to review briefly current concepts of snakebite treatment.

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Poisonous Snakes

Ten species or sub-species of poisonous snakes are indigenous to California. All are rattlesnakes. According to Klauber,[1] the rattlesnakes found in California include: the western diamond *(Crotalus atrox)*, the Mojave Desert sidewinder *(Crotalus cerastes cerastes)*, the Colorado Desert sidewinder *(C. cerastes laterorepens)*, the southwestern speckled (*C. mitchelli pyrrhus)* and the Panamint *(C. mitchelli stephensi)*. Also, the red diamond rattlesnake *(C. ruber ruber)*, the Mojave *(C. scutulatus scutulatus)*, the Southern Pacific *(C. viridis helleri)*, the Great Basin *(C. viridis lutosus)*, and the Northern Pacific *(C. viridis oreganus)*. Coral snakes are not native to California but are found in Arizona and Mexico.

Rattlesnakes are pit vipers (as are copperheads and cottonmouth moccasins). They are so named because of a characteristic pit which is located between the eye and nostril on each side of the body. Pit vipers also are identified by elliptical pupils in the eyes and by two well-developed fangs which protrude from the maxillae when the snake's mouth is opened. Rattlesnakes have rattles which are attached to their tails. Harmless snakes do not have facial pits, they have round rather than elliptical pupils, and while they have teeth they do not have fangs.

Oftentimes people will chop off the head of a snake which has bitten someone and bring the snake's body in for identification. Without the head pit vipers can be identified by turning the snake's belly upward and noting a single row of subcaudal plates just below the anal plate. Harmless snakes have a double row of subcaudal plates. Figure 1 depicts the characteristic features of pit vipers and harmless snakes.

Methods of Study

A questionnaire and letter explaining the purpose of this study were mailed to a "selected" group of California hospitals listed in the Hospitals Guide Issue of the Journal of the American Hospital Association. The hospitals selected for this study were general hospitals, children's hospitals and college infirmaries. Questionnaires were also sent to Army, Navy, Coast Guard, Public Health Service, Air Force and Veterans Administration hospitals. Maternity, tuberculosis and mental hospitals were omitted, as they would not be expected to treat snakebite victims. A total of 356 California hospitals made up the study group. Each hospital was asked to report all in-patients admitted to the hospital for snakebite treatment during 1958 and 1959.

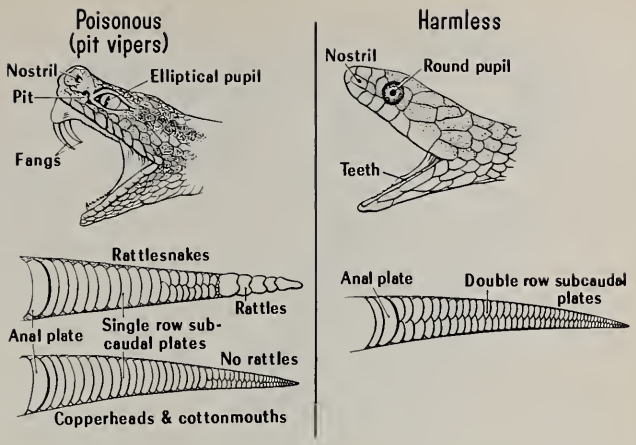


Figure 1.—Characteristic features of poisonous (pit vipers) and harmless snakes.

Most hospitals do not code and tabulate the diagnoses of emergency room and out-patient clinic visits. Since some snakebite victims are not admitted to the hospital as in-patients, it seemed essential to ask a sample of practicing physicians how many snakebite victims they treated both as out-patients (office, home, emergency room, etc.) and as in-patients. Previous surveys[4,7] have shown that most people with venomous snakebites are treated by general practitioners, surgeons, internists, pediatricians and orthopedic surgeons. Therefore questionnaires were sent to a random sample of one-third of all the California physicians in these categories of practice who were listed in the AMA American Medical Directory.

Death certificates in fatal snakebite cases were obtained from the California State Department of Public Health.

Results

This report is based on questionnaires returned by 349 (98 per cent) of 356 California hospitals. It is supplemented by questionnaires returned by 2,495 (74 per cent) of 3,387 practicing physicians in the state. The California State Department of Public Health indicated that there was one snakebite death in 1959 and none in 1958.

Incidence

California hospitals reported a total of 146 in-patients treated for poisonous snakebites during 1958 and 1959. There were 68 cases in 1958 and 78 in 1959, an average of 73 cases per year. Detailed case reports were received for 135 of the 146 snakebite cases reported during 1958 and 1959. All the analyses in this paper, excluding the estimate of incidence, were based on the 135 detailed case reports received from hospitals.

Physicians' reports, when adjusted to account for all California physicians in the practice cate-

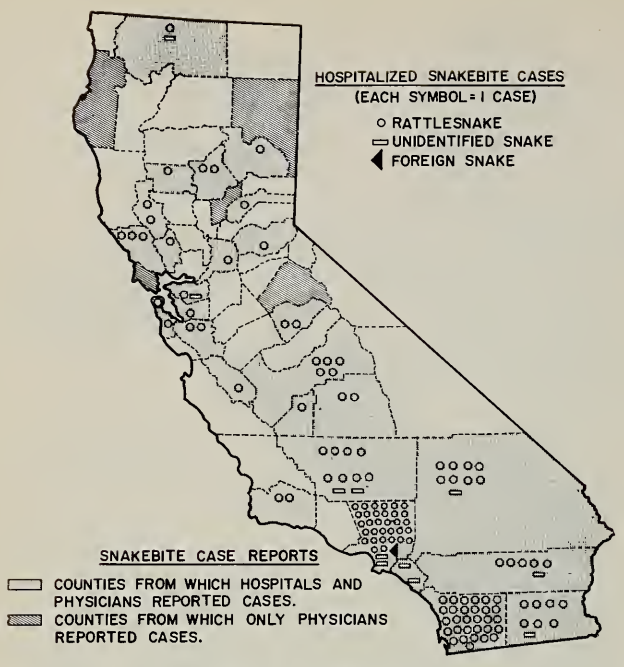


Figure 2.—Geographical distribution of poisonous snakebites in California, 1958 and 1959.

gories mentioned, indicated that approximately 138 in-patients and 83 out-patients were treated for snakebite accidents each year. This estimate takes into account the elimination of duplicate reports by hospitals and physicians. The difference between the estimate of 138 in-patients treated by physicians and the average of 73 in-patients reported by hospitals can be explained, in part, by the following facts: (1) seven California hospitals did not participate in the study; (2) there was evidence of under reporting snakebite in-patients from 15 hospitals which participated in the study; and (3) physicians indicated that many patients were treated in small clinics and hospitals not listed in the AHA Hospitals Guide Issue. Taking all of these various reports into consideration, we estimate that approximately 221 (138 in-patients and 83 out-patients) persons are treated annually for poisonous snakebites in California—an annual incidence of 1.41 bites per 100,000 population.

Geopathology

The geographical distribution of snakebites reported in California during 1958 and 1959 may be seen in Figure 2. The lightly shaded counties are those from which hospitals reported in-patients treated for snakebites. An appropriate symbol is used to show where each hospital patient was treated and what kind of snake bit him. The darker shaded counties are those from which physicians reported snakebite cases but from which no cases were reported by hospitals.

Of 135 persons put in hospital for snakebite treatment and for whom detailed records were available, 123 (91 per cent) were bitten by rattlesnakes, one (1 per cent) by a foreign snake, and 11 (8 per cent) by unidentified poisonous snakes. Of the bites inflicted by rattlesnakes, the following species were incriminated: Northern Pacific, 12 bites; Southern Pacific, ten bites; western diamond, seven bites; sidewinders, seven bites; red diamond, four bites; and Mojave, three bites. By comparing the geographic location of the case reports with the ecological distribution of snakes described by Klauber,[1] apparently the Panamint and the Great Basin rattlesnakes do not bite many people in California. One victim was bitten by an Australian tiger snake *(Notechis scutatus)* in Los Angeles. He was critically ill but survived after heroic treatment.

Figure 2 shows that poisonous snakebites occurred in all sections of California but were most frequent in Southern California, less frequent in Central California and least frequent in Northern California. Most bites (76 per cent) were reported from the ten southernmost counties in the state.

Temporal Relationships

The monthly distribution of snakebite accidents is shown in Table 1. Snakebites were infrequent during the colder months of the year—November, December, January, February and March. In general, snakes are usually hibernating or are inactive during the colder months. Most snakebites in California occurred from April through October when 121 (90 per cent) of the 135 bites were inflicted. This striking seasonal distribution of bites coincides with the time that snakes are most abundant and active and with the time that people have greater exposure due to out-of-doors occupations and recreation. Similar "seasonal epidemics" of venomous snakebites have been observed in New England, and Florida.[4,7]

The time of day when most snakebite accidents happened was the three-hour period from 3:00-5:59 p.m. when 37 (27 per cent) persons were bitten. The number of bites, by three-hour periods, were: 6:00-8:59 a.m., ten bites; 9:00-11:59 a.m., 22 bites; 12:00 noon-2:59 p.m., 27 bites; 3:00-5:59 p.m., 37 bites; 6:00-8:59 p.m., 24 bites; and 9:00-11:59 p.m., 8 bites. There were no bites from 12:00 midnight to 5:59 a.m. For seven cases the time of the bite was not recorded.

Bite Victims

There were 108 white males, 24 white females, two non-white males and one non-white female admitted to California hospitals for snakebite treatment during 1958 and 1959. Of the non-whites, two were Indians and one was a Negro. Using the 1960 census for the population of Cali-

fornia the bite rates per 100,000 population were: 1.50 for white males, 0.31 for non-white males, 0.33 for white females and 0.16 for non-white females.

The age distribution of California bite victims is shown in Table 2. The largest number of bites happened to children and youths 10 to 19 years of age (37 bites) and those 0 to 9 years of age (31 bites). Indeed 50 per cent of all snakebites were inflicted on children and young adults less than 20 years of age. Age-specific bite rates are much more meaningful since they take into account the population at risk in a particular age group. The highest biannual bite rates per 100,000 population were: 10 to 19 years of age (1.47) and 20 to 29 years of age (1.30). The lowest bite rate was found for people 50 to 59 years of age.

An analysis of the occupations of the patients showed that 68 were children, 15 were laborers other than farm laborers, ten were farmers or farm laborers, seven were professionals, five were housewives and four were craftsmen. In addition, 11 were members of the Armed Services, three were unemployed, two were managers and one was a clerk. The occupation was not stated for the remaining bite victims.

Activity and Place

Twenty-three bites occurred while people were handling a poisonous snake. Eighteen happened while children were playing, ten in their own yards and eight elsewhere. Ten persons were bitten while working on a farm or ranch, six while hunting or fishing, six while picking up lumber or a log, five while working in their own yards, and five while on Army or Navy field exercises. Three people were bitten while walking on or near a highway, three while reaching into an obscure place, and three while working or playing about a barn or hen-house. For the remaining patients the activity was not stated.

The place where the bite accident happened is closely related to what the patient was doing when bitten. The largest number of snakebites, 15, happened right in the patients' own yards. Eleven people were bitten in a field away from the house, ten on a farm or ranch not near the house, ten in the woods, eight in or under a building, eight near a lake, river or body of water, five in a field near the house, three in a barn or hen house and three on or near a highway. The place the bite accident happened was not coded for the other patients.

Site and Severity

The anatomical sites on human beings where venomous snakes inflicted their bites are shown in Table 3. Ninety-nine per cent of the bites were inflicted on the extremities—65 per cent on the upper and 34 per cent on the lower. On the upper extremities the fingers and hands were the parts most often bitten. The feet and lower legs, including the ankles, were the most common sites on the lower extremities. In one case the site was not recorded.

A modification of the clinical classification of pit vipers venenation by Wood, Hoback and Green[10] was used to determine the severity of bites. Bites were classified as follows:

GRADE 0—*No venenation.* Fang or tooth marks, minimal pain, less than one inch of surrounding edema and erythema. No systemic involvement.

GRADE I—*Minimal venenation.* Fang or tooth marks, severe pain, 1 to 5 inches of surrounding edema and erythema in first 12 hours after bite. No systemic involvement usually present.

TABLE 1.—*Seasonal Distribution of Poisonous Snakebites in California, 1958 and 1959*

Month	Number of Bites	Month	Number of Bites
January	2	July	20
February	2	August	21
March	5	September	16
April	19	October	6
May	23	November	4
June	16	December	1

TABLE 2.—*Age Distribution of Snakebite Victims Treated in Hospital in California, 1958 and 1959*

Age Group (years)	Population at Risk*	Number of Bites	Rate per 100,000†
0-9	3,345,951	31	0.93
10-19	2,513,766	37	1.47
20-29	1,999,743	26	1.30
30-39	2,319,498	23	0.99
40-49	2,044,658	7	0.34
50-59	1,528,192	4	0.26
60-69	1,101,743	4	0.36
70 or more	863,653	3	0.35

*Based on the 1960 Census of the Population of California.

†These rates are only on hospitalized patients for whom information was available.

TABLE 3.—*Anatomical Sites of Bites By Poisonous Snakes in California, 1958 and 1959*

Anatomical Site of Bite	Side of Body		Total Number of Bites
	Right	Left	
Head, face and neck	0	0	0
Trunk, front	0	0	0
Trunk, back	0	0	0
Upper arm	3	0	3
Forearm	4	5	9
Hand	10	11	21
Fingers	27	28	55
Upper leg	1	3	4
Lower leg and ankle	18	10	28
Foot	4	6	10
Toes	2	2	4
Not stated			1

GRADE II—*Moderate venenation.* Fang or tooth marks, severe pain, 6 to 12 inches of surrounding edema and erythema in first 12 hours after bite, systemic involvement may be present—nausea, vomiting, giddiness, shock or neurotoxic symptoms.

GRADE III—*Severe venenation.* Fang or tooth marks, severe pain, more than 12 inches of surrounding edema and erythema in first 12 hours after bite, systemic involvement usually present as in Grade II.

The severity of venenation (venom poisoning) was classified as follows for 128 patients treated in hospital: 42 (33 per cent) were Grade 0; 29 (23 per cent) were Grade I; 27 (21 per cent) were Grade II; and 30 (23 per cent) were Grade III. For the remaining seven patients treated in hospital the severity or venenation was not stated. There was one death among the 135 hospital patients in this series, a case-fatality rate of 0.7 per cent. When the total number of snakebite cases per year is taken into account (in-patients plus out-patients), the true case-fatality rate probably is less than 0.5 per cent. This is confirmed by the fact that only 12 people in California died of snakebite from 1950 to 1959.[3] The fatal snakebite in 1959 involved a four year old boy who was bitten on the foot by a rattlesnake when he stepped into a hole in his yard. He died 16 hours later. Contrary to popular belief, few patients die within the first few hours following a snakebite. About 70 per cent of them die from 6 to 48 hours after venenation takes place.[5] According to Russell[8,9] deaths from rattlesnake bites in Southern California have been attributed to intraperitoneal or retroperitoneal hemorrhage associated with hemolytic anemia, to acute pulmonary edema associated with respiratory failure, or to vascular collapse associated with acute hemolysis. He also noted that vascular collapse may occur through direct action of the venom on the heart. The two papers by Russell[8,9] are highly recommended for readers who are interested in the toxicologic features of rattlesnake venoms and the signs and symptoms of rattlesnake venom poisoning.

Treatment

The current treatment of North American pit viper (rattlesnake, cottonmouth moccasin and copperhead) bites includes both minor surgical procedures and conservative forms of treatment. A constricting band (tourniquet) should be applied lightly to the involved extremity several inches proximal to the bite. The constricting band should be applied only tight enough to occlude the superficial venous and lymphatic flow. It must not occlude the arterial circulation and it should be released every 10 to 15 minutes for a minute or two. As edema resulting from venom poisoning spreads, the constricting band should be advanced to keep just ahead of the swelling. The purpose of the constricting band is to impede the spread of venom until incision and suction can be used to remove the venom mechanically and/or until antivenin can be administered to neutralize the venom.

Incision and suction is effective in removing venom from experimental animals up to about 120 minutes after the venom is injected. The sooner it is used, the larger the amount of venom that can be removed. Suction should be used for about one hour. We have found the suction cups supplied in the Cutter and the Becton-Dickinson snakebite first-aid kits effective for removing pit viper venom. Incisions one-quarter inch long and one-eighth to one-quarter inch deep are made into the subcutaneous tissues over the fang punctures. A few additional incisions (three to five) may be made in the surrounding edematous tissues. A large number of incisions is not needed. Immobilization aids in limiting the spread of venom. However, if one must decide between immobilization or seeking prompt medical treatment, the latter should be sought.

The "3 A's" (antivenin, antibiotics, and tetanus antitoxin and/or toxoid) are recommended, in addition to incision and suction, in treating all serious pit viper bites. Antivenin Crotalidae Polyvalent (Wyeth) is effective in neutralizing the venoms of all North American pit vipers. It is not protective against coral snake venom. Since antivenin is manufactured from horse serum, a skin test should be done before antivenin is given. For Grade I venenations, antivenin may be administered in the deltoid or gluteus muscles. In Grade II and Grade III venenations, antivenin diluted in 1000 ml of normal saline solution may be given intravenously.[6] Studies with radioisotopes have shown that antivenin accumulates at the site of the bite more rapidly after intravenous administration than after intramuscular administration.[2] Injection of antivenin into the local bite area is not a particularly effective way to administer antivenin. We have found the following amounts of antivenin useful in treating the various Grades of venenation: Grade 0 (no venenation) requires no antivenin; Grade I (minimal venenation) may require 10 ml (one ampoule) of antivenin; Grade II (moderate venenation) requires 30 to 40 ml of antivenin; and Grade III (severe venenation) requires 50 ml or more of antivenin.

Since snakes' mouths and venoms may harbor pathogenic organisms, antibiotics and tetanus anti-

toxin and/or toxoid should be given prophylactically. Gram-negative organisms predominate, hence a broad-spectrum antibiotic is indicated. Penicillin used by itself is not adequate treatment.

Cortisone and ACTH do not affect the survival rate of animals poisoned with pit viper venom. They probably should not be used during the first few days after venenation, although they may be beneficial later in treating serum sickness resulting from antivenin therapy. Antihistamines are contraindicated, as they shorten the survival time of animals poisoned with pit viper venoms. Shock resulting from venom poisoning should be treated with infusions of blood, plasma, saline solution and vasopressor drugs. Meperidine hydrochloride and other analgesics may be given to relieve pain. Recently there have been reports of excessive tissue necrosis and amputations associated with cold therapy such as packing an extremity in ice or using ethyl chloride.[2] In our opinion, cold therapy should not be used in treating pit viper bites.

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REFERENCES

1. Klauber, L. M.: Rattlesnakes: Their habits, life histories, and influence on mankind, Vol. 1, Berkeley, University of California Press, 1956.

2. McCollough, N. C., and Gennaro, J. F., Jr.: Evaluation of venomous snake bite in the Southern United States from parallel clinical and laboratory investigations: Development of treatment, J. Florida M. A., 49:959-967, June, 1963.

3. Parrish, H. M.: Analysis of 460 fatalities from venomous animals in the United States, Am. J. Med. Sc., 245:129-141, Feb., 1963.

4. Parrish, H. M.: On the incidence of poisonous snakebites in Florida: Analysis of 241 cases occurring during 1954 and 1955, Am. J. Trop. Med., 6:761-765, July, 1957.

5. Parrish, H. M.: Mortality from snakebites, United States, 1950-1954, Public Health Reports, 72:1027-1030, Nov., 1957.

6. Parrish, H. M.: Intravenous antivenin in clinical snake venom poisoning, Missouri Med., 60:240-244, Mar., 1963.

7. Parrish, H. M., Badgley, R. F., and Carr, C. A.: Poisonous snake bites in New England, NEJM, 263:788-793, Oct. 20, 1960.

8. Russell, F. E.: Rattlesnake bites in Southern California, Am. J. Med. Sc., 239:1-10, Jan., 1960.

9. Russell, F. E.: Snake venom poisoning in Southern California, California Med., 93:347-350, Dec., 1960.

10. Wood, J. T., Hoback, W. W., and Green, T. W.: Treatment of snake venom poisoning with ACTH and cortisone, Virginia M. Monthly, 82:130-135, Mar., 1955.

CORRECTION

On Page 243 of the October 1963 issue of CALIFORNIA MEDICINE two charts were transposed. The chart above the legend for Chart 2 is Chart 3; that above the legend for Chart 3 is Chart 2.

Effects of Moderate Altitude on patients with Pulmonary and Cardiac Impairment

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■ *Twenty ambulatory patients with severe chronic pulmonary disease and 24 with severe heart disease were exposed in an altitude chamber to a simulated altitude of 8000 feet such as might exist in pressurized aircraft. Eight of the patients in the pulmonary group experienced undesirable reactions related to hypoxia, hypoventilation, inability to hyperventilate and expansion of gases. None of the 24 patients with cardiac disease experienced this same difficulty and all tolerated the procedure well. The ability to tolerate the stress of moderate altitude is related more to ventilatory efficiency and the maintenance of adequate oxygen saturation than to cardiovascular factors.*

It is recommended that a thorough evaluation of the cardio-pulmonary patient by clinical and physiological tests be made before exposure to altitude. When severe impairment is demonstrated, the subject may still be able to tolerate moderate altitudes if appropriate measures are provided to cope with the altered physiologic conditions.

FREQUENTLY a patient with a cardiac or pulmonary disorder asks whether he may safely expose himself to moderately high altitudes (up to 10,000 feet). The question may arise in planning a vacation, trip, pilgrimage, transfer to a medical clinic or for other similar situations.

To answer such a question intelligently it is necessary to know the disease process, how much it limits functions, the mode of travel, the duration of exposure, the purpose of the trip and the activity involved (Table 1).

Exposure to altitude is common; it may be acute, subacute or chronic. This discussion will deal only with acute exposures such as may occur in flight and other forms of travel.

Extensive surveys and studies have been made in reference to air travel. For the most part the reports support the general point of view that any passenger able to walk up a loading ramp can tolerate the stresses of a commercial passenger trip or if he can travel at all he can travel safely by air. Although safe for the majority, altitude imposes a risk to a few. Provision of measures to counteract the effects of altitude will allow these few to make a trip comfortably and safely.

The normal person can ascend to and tolerate an altitude of 5,000 to 10,000 feet without ill effects, experiencing only minor visual defects, easy fatigue and shortness of breath on effort. He adjusts by increasing ventilation and circulation.

Patients with cardio-pulmonary diseases require particular attention since adjustments to altitude are primarily pulmonary and circulatory. A majority of the deaths in civilian air transportation have been reported as cardiac or pulmonary.[2] Marberger and coworkers demonstrated that patients with angina, when exposed to altitudes of 8,000 to 18,000 feet, experience increased frequency of attacks and show electrocardiographic and other changes, relieved by administration of oxygen.[6]

With regard to pulmonary conditions, the committee on respiratory physiology of the American College of Chest Physicians has published specific criteria for passenger flight. By these criteria a passenger, after medical appraisal, is placed in one of five categories with allowable cabin limits from 2,000 feet to a top of 10,000 feet. Respiratory acidosis and ventilatory restriction were stressed as the most important limiting factors.[1]

Gordon, Wilson, Stonehill and Morsey, in discussing air travel by patients with respiratory diseases, pointed out that serious obstructive impairment (emphysema), restrictive abnormalities (effusion and fibrosis) and gas exchange defects present problems in connection with air travel.[4] They recommended that patients should not go above 8,000 feet—6,000 feet if cyanosis is present, and 4,000 feet if emphysema with acidosis exists. With oxygen supplementation, they believed any patient could fly. They advised against administration of oxygen in respiratory acidosis.

In discussing considerations in selecting airline passengers, Kidera,[5] set down criteria which, if followed, would keep many patients from traveling by air.

The U.S. Air Force has evacuated over 2,000,000 patients by air ambulance. Downey and Strickland analyzed 1,800 flights of patients with cardiac and pulmonary diseases, including myocardial infarction and pneumothorax, without apparent deleterious effects or contraindication to flight transportation. These flights, however, were made with well trained personnel and adequate facilities available.[3]

Methods and Procedures

In order to test the ability of patients with cardiorespiratory diseases to tolerate moderate altitudes, an altitude tolerance test was devised. The proce-

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TABLE 1.—*Actual Altitudes as Compared With "Cabin Altitudes" in Six Aircraft Commonly Used by American Carriers*

Ambient Alt., feet	*Simulated (Cabin) Altitude, Feet, in*					
	Boeing 707	*Douglas DC-8*	*Lockheed Electra*	*Vickers Viscount**	*Douglass DC-7*	*Convair 240*
40,000	7,500	7,000				
35,000	5,500	5,000				
30,000	3,700	3,200	8,000			
25,000	1,400	1,000	5,400	7,900	8,000	
22,500	Sea level	Sea level	4,100	6,510	6,500	
20,000			2,650	4,930	5,000	9,700
15,000			Sea level	1,750	1,800	6,000
10,000				Sea level	Sea level	2,000
7,500						200
5,000						Sea level

* Usually operated at a pressure of 5.5 lb. per square inch.
From *Aerospace Medicine*, Vol. 32, (May) 1961.

dure consisted of exposing selected patients to altitudes in a decompression chamber. This chamber consisted of main and lock sections designed for physiologic monitoring and communication. The main portion was sufficiently large to accommodate a physician observer, a flight nurse and the subject. Seats of the kind used in airlines were installed and there was adequate room for limited movement about the chamber. Outside were a physician-observer and the operator of the chamber.

Twenty patients with chronic pulmonary disease[7] and 24 with heart disease were selected for the study. The main criteria for selection was that the patients be ambulatory. All patients in the pulmonary group had severe disease with pronounced impairment and their condition was evaluated from a clinical and physiological standpoint before they were exposed to the simulated high altitude. A preflight physical examination was done just before they entered the chamber. "Ascent" was made at 300 feet per minute. At 2,000 feet basic measurements such as pulse, temperature, blood pressure, oximetry, pulmonary function, electrocardiographic and respiratory rate were recorded. During an exercise the pulse rate, respiration, an electrocardiogram and other indicative phenomena were monitored. The exercise test consisted of 8-inch step-ups not exceeding 15 per minute. Ascent was made to 8,000 feet and then, after an appropriate waiting period, all the basic measurements were repeated. A meal equivalent in quantity and quality to that of a commercial airliner was served. Basic determinations were again carried out. Descent at approximately 300 feet per minute to ground level was made. The experiments lasted up to four hours.

TABLE 2.—*Major Diagnosis in 20 Patients With Pulmonary Disease Studied in Altitude Experiment*

	Number of Patients
Diffuse pulmonary fibrosis	1
Silico-tuberculosis	2
Histoplasmosis and emphysema	2
Emphysema	1
Pneumonectomies	13
Inoperable bronchogenic carcinoma	1

TABLE 3.—*Major Diagnosis in 27 Patients With Heart Disease Studied in Altitude Experiment*

Diagnosis	*Number of Patients*
Rheumatic heart disease (R.H.D. post-commissurotomy—3)	9
Arteriosclerotic heart disease (including angina pectoris)	7
Hypertensive cardiovascular disease	4
Myocarditis	3
Congenital heart disease (Atrial septal defect) (A.S.D. repaired surgically—1)	2
Leutic heart disease	1
Constrictive pericarditis	1

TABLE 4.—*Functional Classification of Cardiac Impairment in Patients Subjected to Altitude Tolerance Experiment*

A.H.A. Classification	*Number of Patients*	*Degree of Impairment*
Class I	2	No limitation of physical activity
Class II	10	Slight or moderate limitation
Class III	12	Marked limitation of physical activity

*American Heart Association.

Results

Results can best be described by dividing the patients into two separate categories, pulmonary and cardiac (Tables 2 and 3). The cardiac cases are further separated into a functional grouping, Table 4, in accordance with the American Heart Association functional classification.

Pulmonary

In the pulmonary group there were 16 males and four females ranging in age from 40 to 73 years of age. They had, variously, pulmonary fibrosis, silicotuberculosis, histoplasmosis, emphysema, carcinoma and postpneumonectomy. Many had a combination of disease processes. Pulmonary function abnormalities consisted of defects in diffusion, ventilation-perfusion, restriction of ventilation, obstruction to ventilation and respiratory insufficiency, alone or in combination.

To illustrate the severity of impairment, the vital capacity ranged from 775 cc to 4800 cc, the latter in a patient who had extensive emphysema with blebs and bullae. In 14 patients the vital capacity was below 50 per cent of predicted; in 19, below 75 per cent of predicted. Seven of the 14 with the vital capacity below 50 per cent tolerated the procedure well.

The maximal voluntary ventilation ranged from 20 liters per minute to 117 liters per minute. In the latter case the patient had a severe diffusion defect due to pulmonary fibrosis. He tolerated the altitude very poorly. Oxygen saturation was measured in only seven cases, in five of them it was below 90 per cent. These five tolerated the altitude poorly.

Twelve of the 20 patients with pulmonary disease satisfactorily tolerated the altitude exposure. The remaining eight had reactions which necessitated a modification in protocol to relieve their distress. In general if the maximal voluntary ventilation was below 40 liters per minute, altitude tolerance was poor. Fourteen of the pulmonary patients com-

plained of dyspnea on exertion before the test. Five of the 14 tolerated the test satisfactorily. The complaint of dyspnea was not particularly helpful as a means of evaluation.

Cardiac

Twelve of the 27 patients with heart disease had cardiomegaly as demonstrated by x-ray films. Eighteen of them were receiving digitalis. Most had had congestive heart failure at some time previously. Several were receiving diuretic agents. In all of them, however, the heart condition was reasonably well compensated at the time of the altitude test. In this group, exercise was not attempted if the resting heart rate exceeded 120 per minute. The extent of exercise that was done as a part of the test was determined by the supervising physician from his pre-test observations and the clinical evaluation. For the patients on a low salt diet, the meal was modified appropriately. Studies of vital capacity, expiratory flow, blood pressure, pulse, electrocardiograph and oximetry were made at various times on this group of patients.

The results in this group of cardiac patients were quite different from those in the pulmonary disease group in that every patient selected tolerated the exposure to 8,000 feet without apparent difficulty. Average resting and post-exercise heart rates were minimally increased by exposure to altitude and the increases after the meal were in the expected range. Blood pressure, vital capacity and expiratory flow rates were unaffected by altitude exposure. Oxygen saturation dropped slightly as expected; otherwise, no clear alteration in the variables studied were observed in the cardiac group (Table 5).

TABLE 5.—*Physiological Responses to Altitude of Patients With Heart Disease*

	2000 feet		*8000 feet*	
	Mean	*Range*	*Mean*	*Range*
Heart rate (beats per minute):				
At rest	83	66-112	86	66-120
After exercise	107	75-150	109	75-150
Postprandial:				
At rest	—	—	90	65-130
After exercise	—	—	116	82-150
Blood pressure at rest:				
Systolic	132	104-240	130	98-210
Diastolic	79	48-120	79	58-160
Oxygen saturation (oximeter), per cent				
At rest	94	83-100	92	82-100
After exercise	—	—	90	75-100
Maximum expiratory flow rate (liters per minute)	233	48-430	238	90-410

Discussion

The major environmental stresses caused by exposure to moderate altitude are hypoxia and expansion of gases due to the reduced barometric pressure. At sea level the barometric pressure is 760 mm of mercury or 14.7 pounds per square inch. At 10,000 feet altitude the barometric pressure is approximately one-third that at ground level. At sea level oxygen exerts a pressure of 160 mm of mercury; at 10,000 feet, 107 mm of mercury. To compensate for this decrease in barometric pressure, hyperventilation and other physiological adjustments take place. At 10,000 feet, oxygen saturation is normally about 90 per cent. In persons with cardio-respiratory impairment, the effects of altitude stresses may become apparent at a much lower altitude than in normal people.

The adverse reactions which occurred in the eight patients with pulmonary disease were as follows: hypoxia (three cases), inability to hyperventilate (three cases), hypoventilation (one case), and expansion of trapped gases (one case). Three of these four factors could have been prevented by the administration of supplemental oxygen and indeed these reactions were treated by oxygen administration. The fourth factor, the expansion of trapped gases, can be relieved only by descent.

Vital capacity was of little value in predicting altitude tolerance, as seven of the 14 patients with 50 per cent or less capacity tolerated the altitude well. The x-ray appearance of the chest was also of little value in predicting the ability to tolerate altitude. Of the many determinations and examinations performed on the patients the oxygen saturation, the maximal voluntary ventilation and the ability to hyperventilate proved most useful. Subjects in whom arterial oxygen saturation was below 90 per cent at ground level tolerated altitude tolerance poorly. This result was anticipated in that such subjects are relatively hypoxic at ground level and have an oxygen saturation equivalent to that of normal persons at 10,000 feet. Likewise, if the maximal voluntary ventilation is below 40 liters per minute, there is little breathing reserve and hyperventilation cannot be sustained. Hypoxia and carbon dioxide retention may occur.

If any of the tests indicate severe impairment, a person should be advised against altitude exposure until more thoroughly investigated. If he insists on traveling, an attendant trained in oxygen administration and acquainted with detecting danger signs should accompany the patient. Such an attendant can administer oxygen when necessary and observe the subject for apnea and other phenomena.

Use of a full battery of tests and examination is justified for any patient with severe pulmonary defects in order to determine the ability to ventilate and to maintain normal oxygen saturation. The measurements of the forced expiratory flow rate,

the maximal voluntary ventilation and the oxygen saturation provide such information. If a full battery of tests is not feasible, it is recommended that the chest be examined by auscultation with emphasis on distribution and intensity of breath sounds. An exercise test should be done and the forced vital capacity measured.

The difference in the altitude tolerance between the patients with pulmonary and those with cardiac disease was not entirely unexpected. All 27 of those with cardiac disease tolerated the altitude well for exposures averaging one and a half hours. Those with cardiac disease did not have significant pulmonary dysfunction and were able to increase their ventilation without difficulty. Also, if pulmonary edema or congestion is absent, gas exchange and a satisfactory oxygen saturation are adequately maintained. Consequently, very little additional burden is put upon the heart to maintain adequate tissue oxygenation. It should be pointed out that the maximum altitude used in these experiments was 8,000 feet. Higher altitudes undoubtedly can be the cause of difficulties for patients with cardiac impairment.

Admittedly, conditions in an altitude chamber are not a perfect simulation of those encountered in the mountains, on a commerical airliner, in a car or on a train. If anything, the effects in a chamber are less stressful in that factors of climate, environment, terrain, vibration and physical activity are not present.

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REFERENCES

1. Committee on Physiological Therapy, American College of Chest Physicians: Air travel in cardio-respiratory disease, Dis. Chest, 37:579, 1960.

2. Committee on Medical Criteria of the Aerospace Medical Association: medical criteria for passenger flying, Aerospace Med., 32:369, 1961.

3. Downey, V. M., Strickland, B. A.: Air transportation of cardiac and pulmonary patients, Ann. Int. Med., 36:525, 1952.

4. Gordon, B. L., Wilson, R. H. L., Stonehill, R. B., and Morsey, C. A.: Air transport of patients with respiratory disease, Dis. Chest, 38:20, 1960.

5. Kidera, G. J.: Medical and surgical considerations in selecting airline passengers, N.Y. St. J. Med., 58:853, 1958.

6. Marbarger, J. P., Wechsberg, P. H., Vawter, G. F., and Franzblau, S. A.: Altitude stress in subjects with impaired cardio-respiratory function, Proj. No. 21-23-019, Report No. 2, USAF School of Aviation Medicine, March, 1953.

7. Shillito, F. H., Tomashefski, J. F., and Ashe, W. F.: The exposure of ambulatory patients to moderate altitudes, Aerospace Med., 34:850, 1963.



Cervical Disc Injury

Symptoms and Conservative Treatment

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■ *Primary traumatic cervical disc disease and chronic disc disease associated with spondylitis aggravated by injury causes referred pain to the head, face, neck, arms, shoulders and chest, and even in the low back. Such pain may be reproduced by the injection of contrast medium for cervical discography. Dorsal nerve root pain is rare.*

Clear-cut disc derangement or annular incompetence may be demonstrated by discography at levels which reproduce symptoms. The pain pattern at each level is not consistent.

Conservative treatment, involving primarily the use of a cervical extension collar, results in substantial improvement in 75 per cent of cases.

THE INCREASING NUMBER of hit-from-behind automobile accidents has provided an excellent opportunity to observe a large number of cervical injuries. Most of the cases in the series of 368 that are the basis of this report were dealt with by the author, although the series includes others in which treatment was given at Doctors Hospital, Santa Ana.

Most cervical injuries of the kind here discussed result from automobile accidents although they may occur through the lifting of heavy objects, prolonged repetitive movements of the head, neck and arms, and occasionally hyper-extension during anesthesial intubation (Fender[6]). Studies of Severy[13] are pertinent; a collision when the offending car is moving at so slow a rate as seven miles an hour may cause serious damage and injury. The forces as described by him (Figure 1) have been supplemented by a stress analysis prepared by this author, in a situation resulting from a blow to the vertex of the skull with the patient in an upright position. The importance of this latter type of force has been neglected heretofore, but increasing interest is being shown in the frequency of cervical disc injuries following blows to the head. Two patients in the present series had evidence of disc derangement at all levels and clinically matched the postmortem findings described by Rabinovitch in 1957.[12] Rabinovitch suggests that this condition may represent a previously undescribed systemic disease of unknown cause involving the fibro-cartilage.

Repeated observations on patients with symptoms following neck injuries suggested that the results of classical neurological diagnostic and

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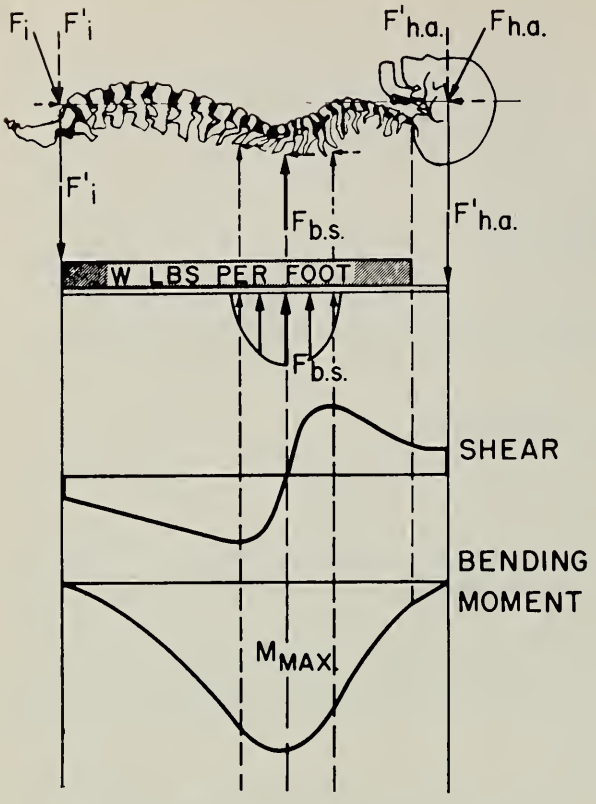


Figure 1.—(Fbs=Fulcrum back support. Fi, F'i, F'h.a., Fh.a.=transverse force components.) The spine must be considered as a single organ and all its components are affected by forces applied at any point throughout its length. Disc failure in the neck is more common than in the lower back with auto collisions because the same forces are concentrated in a smaller vertebra. (Author's interpretation from Severy,[13] with permission.)

therapeutic procedures were inadequate. Taken together, a number of observations strengthen suspicion that some etiological factor is being overlooked. Perplexing in this regard is the pattern of symptoms reported individually by a large number of patients, failure to disclose pathological change by myelographic or electromyelographic examination, failure to respond to symptomatic treatment.

Immediate Symptoms

Cord concussion causing temporary quadriplegia without loss of consciousness may only be explained by distortion of the cervical cord during extremes of movement of the cervical spine. Scrutiny of motion pictures of blows to the jaw in boxing matches confirms the possibility of this distortion. Usually after such damage, use of limbs is regained over a period of an hour or more. This complication has been seen by me six times.

Other immediate symptoms may occur within the first 12 hours following the accident, and are separated from the delayed symptoms by a period of improvement, or perhaps an apparent recovery. Commonest of these is giddiness which is usually likened by the patient to a feeling of uncertainty about his environment. Rarely does true vertigo occur. This giddiness is aggravated by head and neck movement. Pain occurs next most frequently and is localized to the neck, usually the back of the neck. This pain is sharp and may be reproduced by the patient in his palpation of the neck. Distant pain to the chest, arm, hand or between the shoulders is sharp and sudden and quickly disappears.

Unfortunately, there may be no immediate symptoms or they may be masked by the pain of other injuries and not remembered by the patient.

Delayed Symptoms

Different kinds of pain occur usually from 12 to 24 hours after the original injury. The onset of pain may be gradual and may not reach maximum until a month or two has elapsed. Sometimes the pain is vague and difficult to localize, and it may be continuous or intermittent. Headache is the most common type of pain, occurring in over 90 per cent of patients. It is initially reported to be retro-orbital, frontal or at the vertex, bilateral or unilateral. It extends into the nape of the neck and into the shoulder. Frequently it is associated with visual blurring or even scintillating scotomata. Onset usually extends over part of an hour but may be very sudden. At lower levels the pain extends to the face and jaws, ears and chest, sometimes bilaterally. Pain in the shoulders, arms and hands is pseudo root-like in distribution, but always manifests with some inconsistency in its margin; frequently only an unexpected finger is involved. Interscapular pain has been reproduced at surgical operation in the awake patient (Cloward[2]). Backache and coccygeal pain occur and may be related to dural irritation.

Pains frequently persist for months following injury. They are aggravated by activities which involve movement of head on the neck or movements of the shoulders. Symonds[17] noted: "The patient also complains that he gets a headache when he exerts himself, or when he is tired or bothered; stooping makes him giddy; he does not sleep as well as he should; he has lost confidence, power of concentration and is depressed."

Observations on Examination

Findings: Changes in muscular tone in the neck, ranging from midline fixation to splinting in extremes of rotation, flexion and extension are present. When assuming recumbency, the patient may clasp his head in his hands or complain that movements

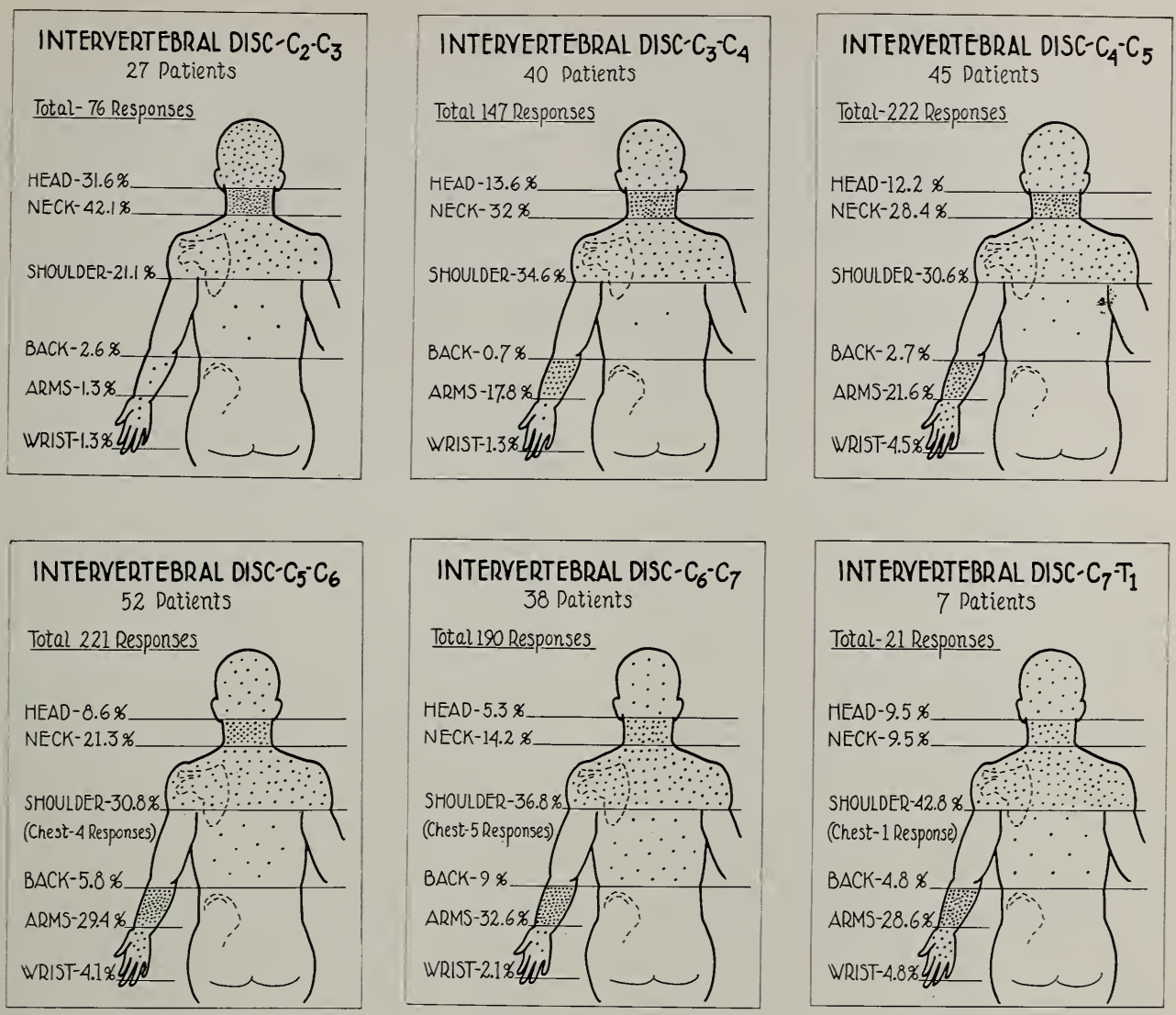


Figure 2.—Pain responses (related to injuries at various levels of the spine in the above drawing) in discography are not from dorsal root irritation. The purpose of discography is to pinpoint the most painful disc in anticipation of surgical operation or in association with therapeutic cortisone injection.

of head and neck result in electric shock-like sensations in the extremities. This was originally described by L'Hermitte[8] as pathognomonic of multiple sclerosis, but is probably evidence of irritation of sensory tracts by swelling of the cord or spinal canal narrowing.

Reflex Changes. The absence of abdominal reflexes is the most frequent finding; this sign is present about half of the time. Biceps, triceps and periosteal radial reflexes are altered. The asymmetry of the reflex findings has no regular relationship with the most painful side.

Motor Symptoms. Muscular weakness and atrophy occur with lateral protrusion of a disc impinging on a nerve root. This is not common. Paresis of the long thoracic nerve also occurs, but the reasons for this are not clear since the nerve supplying it receives a filament from three levels. In the cases in this series, disc abnormalities as radiographically observed did not coincide with these levels. Recovery seems to occur in all cases. Partial spastic hemiparesis below the distribution of the sixth cervical nerve has been seen twice, but not cord transection.

Sensory Symptoms. Pain has already been discussed. Vague and inconsistent hypesthesias also occur. The areas have indiscrete margins. Usually the hands and forearms are involved and the involvement may vary from examination to examination. This suggests hysteria; but it is also reminiscent of attempts to map out hypesthesia or paresthesia present in the abdominal wall in acute appendicitis or acute cholecystitis. Miscellaneous signs include tenderness on palpation of the most proximate cervical spinous process when the patient is prone with head resting on clenched fists. With

this local pain may come the referred head, arm, shoulder or back pain of which the patient complains. This is considered pathognomonic. Pulse obliteration is evidence of scalene spasm or hypertrophy. This may be primary or it may be secondary to splinting of an injured joint. Surgical section of the muscle sometimes is required for differentiation. Torticollis and roto-scoliosis have been observed. Their relationship to the injury is obscure and is being investigated.

Electroencephalographic response may be altered and psychiatric abnormalities are also common and unexplained. It is noteworthy that the reticular activating substance descends to the upper thoracic segments.

It was noted that pain reported by these patients was suggestive of that described experimentally by Lewis,[11] Campbell and Parsons[1] and Cloward.[2] Campbell and Parsons were dealing generally with stimulation of the periosteum, dura and intraspinous ligaments. More specific pain patterns seemed to occur when discs were distended with opaque material for discographic examination.

The pain responses observed in these circumstances in the present series are illustrated in Figure 2 and are noteworthy only for their lack of specificity. These responses are presumed to result from the stimulation of an injured disc by the contrast media. Normal discs absorb dye poorly, and usually the injection causes only local pain. Dublin[4] conjectured that injury probably destroys the continuity of the fibrous annulus which then transmits hydraulic pressure changes to the sensitive periphery of the disc.

The pathway for this pain in the spinal cord is obscure. It is important to note that it is not dependent on dorsal nerve root irritation; it lacks Sherrington's "vehement" characteristic. Rabinovitch[12] only occasionally found a ruptured disc pressing on the dorsal nerve root. My studies in this series confirmed this observation. Frequently the disc margins were well outlined by the contrast medium (Hypaque®), and were not proximate to the nerve root despite root-like pain. Lewis'[11] criteria for visceral pain seemed well confirmed in the cases I observed. Notochord vestiges carried in the discs may preserve the visceral innervation responsible. It has also been noted at myelography that occasionally the anterior root filaments are clearly outlined over a minimally bulging disc. They are not otherwise seen. This suggests the possibility of some pain being transmitted antidromically. I do not believe that this possibility is gainsaid by Frykholmb's work, as the phenomenon of "summation" has not been eliminated. The suggestion by Stewart[15] and Fay[5] that these pain pathways are primarily over the vertebral artery may have merit in occasional cases, but in the cases in the present series in which vertebral angiograms were made, no defect of the artery was observed. Patients who had evidence of vertebral artery impingment had clinical evidence of basilar artery insufficiency.

Myelography. Usually in the more recent cases in the series dorsal and cervical myelographic examinations were carried out before discography was done. The relative accuracy of these measures is shown in Table 1.

Discography. In myelography, credence was given to minimal transtable bulges or anterior-posterior defects which previously had been considered insignificant. Discography seems more demonstrative visually, and it aids further in that the process of injection reproduces or emphasizes the patient's symptoms. Discography is of no value in asymptomatic patients (Holt[9]) and is used chiefly in those cases in which the results of conservative treatment have not been adequate. It pinpoints the selection of the painful or most painful disc. An additional confirmation is received by the voluntarily reported relief noted when the pain from the injection of Hypaque® is relieved by procaine without the patient's knowledge of its use. As in the anamnesis, discretion was used in accepting the patient's voluntary remarks without the use of leading questions.

The criticism has been offered that symptoms and findings at discography are artefactual and caused by the introduction of the needle into the disc space. If a 20 gauge needle is used to perforate the disc, the criticism certainly may have merit. Never in the present series was a needle larger than 25 gauge used. In time, the examiner becomes well skilled in proper placement on the first attempt. In the present series, when perforation of the disc was not skillfully done (that is, there was either more than one perforation or the needle was placed too deep), less credence was given to the results of discography. This did not happen often, however.

Treatment

Therapeutic injection of procaine was ineffective in this series but local administrations of cortisone seemed to bring about temporary remission of symptoms. A cervical extension collar is an ancient remedy, but Symonds[17] recognized that the strict use of this device could alter pathological toe signs and perhaps indefinitely delay paraplegia in patients with spondylitis when operation could not be done. Symonds stressed the need for the rigidity of the collar and diligence in its use. A cervical contour pillow (Jackson[10]) and contour position (Soto-Hall[14]) are necessary during recumbency.

There is a difference of opinion concerning whether injuries of the kind under discussion are best treated by immobilization or by active physical therapy consisting of diathermy and cervical traction or manipulation. The experience of Crowe[3] is confirmed by my observation. It has been my experience that physical therapy results in aggravation of symptoms, eventually causing the patient to discontinue treatment. Admittedly, this observation is at variance with the reported experience in low-back disc disease, in which improvement occurs usually with increasing mobility.

Toleration of the cervical extension collar by the patient is best attained only by a gradual increase in use over a period of 10 days to two weeks and by the relief of symptoms. Once in awhile a slight exacerbation of symptoms occurs when the collar is first worn, but very rarely does this necessitate discontinuing its use. For patients using the collar, I usually restrict activities for six months and maintain intermittent examinations during that time. The collar is then gradually removed and activities gradually increased. If the patient's progress is satisfactory and the symptoms disappear, return of the patient to full duty is recommended. Conservative treatment as here described brings about substantial improvement in about 75 per cent of cases.

Should the removal of the collar be associated with a recurrence of symptoms, surgical consultation is obtained.

It is not within the scope of this paper to consider in detail the results of surgical treatment but insofar as those patients who have been operated upon turn to a neurologist for follow-up, it seems reasonable to present the subject from an internist's point of view. In the Orange County series, in 112 cases fused by modification of Cloward technique, the incidence of infection was approximately 7 per cent. In another series,[16] it has been reported to be only 0.05 per cent. In about 5 per cent of cases, operation resulted in pseudo-arthrosis. This author is impressed with the fact that if the fusion is complete and there is no phantom joint space remaining, the patients invariably do well. As in other surgical procedures, good results depend on careful and meticulous execution of a well designed surgical procedure. If the procedure is not carefully done, and a phantom joint space remains, pain often persists. When the fusion is solid and no remnants of the previous joint can be seen anteriorly, the result is usually excellent. Of 11 patients with posterior fusion, all remained disabled and in pain at last report.

TABLE 1.—*Myelographic Findings in 78 Patients with Abnormal Discogram*

	No.	*Per Cent*
Abnormal cervical myelogram	29	36
Normal cervical myelogram (but reported as showing)	49	63
Anterior-posterior defect—		
Transverse band	4	5
Blunted root sleeve	6	7
Crosstable defect—		
Indentation	28	36
No variation	11	14

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REFERENCES

1. Campbell, D. G., and Parsons, C. M.: Referred head pain, J. Nerv. Ment. Dis., 99, 544-51, 1944.

2. Cloward, R.: Cervical discography, Amer. J. Roentgen., 79:563, April, 1958.

3. Crowe, H.: A new diagnostic sign in neck injuries, Calif. Med., 100:12, Jan., 1964.

4. Dublin. V. B.: Fundamentals of Neuropathology, Charles C Thomas, Springfield, Ill., 1954.

5. Fay, T.: Certain fundamental cerebral signs and symptoms and their response to dehydration, Arch. Neurol. & Psychiat., 26:254, 1931.

6. Fender, F. A.: New hazards in cervical laminectomy, J.A.M.A., 149:227, May, 1952.

7. Frykholmb, R.: Pain sensations produced by stimulation of ventral roots in man, Acta Physiologica Scandinavia Supp. 106, 29:455, 1955.

8. L'Hermitte, J.: Multiple sclerosis: Sensations of an electric discharge as an early sign, Arch. Neurol. & Psychiat., 22:5, July, 1929.

9. Holt, E. P.: Fallacy of cervical discography, J.A.M.A., 188:9, June 1, 1964.

10. Jackson, R.: Cervical Syndrome, Charles C Thomas, Springfield, Ill., 1958.

11. Lewis, T.: Pain, Macmillan Co., New York, 1942.

12. Rabinovitch, F.: Diseases of the Intervertebral Disc and Its Surrounding Tissues, Charles C Thomas, Springfield, Ill., 1960.

13. Severy, D.: Automobile collisions on purpose, Human Factors, 2:186-203, Nov. 1960.

14. Soto-Hall, R.: The conservative treatment of low back pain, Med. Science, 14:23, Aug., 1963.

15. Stewart, D. V.: Personal communication.

16. Stuck, R. M.: Anterior cervical disc excision and fusion, Rocky Mountain Med. J., 60:25-30, June, 1963.

17. Symonds, C.: The inter-relation of trauma and cervical spondylosis in compression of the cervical cord, Lancet, 1:451, March 7, 1953.

18. Symonds, C.: Injuries to the Brain and Spinal Cord, Samuel Brock, Springer Publishing Co., Inc., New York, 1960.

19. Symonds, C.: 1957 Lecture UCLA Medical School, Dept. of Neurology and Neurosurgery.

The Practicing Physician and the Advance of Medical Knowledge

A Conference on Continuing Education

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COMPARED with the vast sums of money and careful organization devoted to the initial training of the physician and to the advance of medical science, both the financing and organizational effort directed toward maintenance and further development of his skill are pitifully small. Under a special grant from the State of California Legislature, 48 representative California physicians met at the University of California Medical Center on May 11, 1963, to discuss the problems of continuing education and possible ways to solve them.

Design of the Conference

The 27,000 physicians practicing in California are not evenly distributed throughout the state; the concentration is greater in the large metropolitan areas. Other factors influencing a physician's participation in continuing education programs are as follows: Less than one-third of California's physicians have alumni ties with a medical school in California; the problems of a general practitioner differ from those of the specialist; the length of time in practice varies; and facilities and ease of participating in programs are greater in the urban areas.

Considering these factors, the president of each county medical society was asked to select a participant best representative of the whole medical community. The Forty-First Medical Society with its widely spread membership sent seven participants. Representatives of the California Medical Association and the State Government, and leaders of medical education in California were also invited.

The conference was divided into two sessions, each composed of small group workshops followed by a general discussion. During the morning session the participants were divided at random into four groups to discuss one of the following questions:

1. What kinds of program content are the most important?
2. What is the most useful course format for practicing physicians?
3. Which are the most valuable major sources of medical information available to the physician?
4. How should the present roles of organizations concerned with continuing education be further developed?

The afternoon workshops were divided into four

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groups of specialists or general practitioners in rural or urban practices. Each group discussed all of the following topics:

1. The extent to which outside experts and intra-community resources should be used in a local setting.

2. The role of regional centers and medical schools in developing programs.

3. The relative importance of different techniques of education and communication.

4. How should continuing medical education be financed?

Following each workshop session, the four moderators presented the conclusions of their groups to the assembly and a general discussion followed.

Results

Although no formal resolutions were made, the group reached general agreement upon the points discussed.

The group forcefully underlined the difficulties in keeping up with newer developments in medicine, but participants were unanimous in their belief that physicians should continue and maintain their education individually. This should be achieved through medical schools, professional societies, community and regional centers and publications sponsored by these groups.

Accessibility was considered most important, particularly for physicians practicing far from a major medical center. Community hospitals should provide part of continuing education, while regional centers and medical schools can be of equal importance in emphasizing different aspects. Traveling clinics, increased "circuit riding," and a greater number of scientific programs with invited speakers were all considered important. The in-service use of consultants from major medical centers appeared especially desirable, and financially feasible.

Programs held at regional centers and medical schools benefit the physician freed of his normal duties in patient care to pursue his education, and the greater resources in teachers and facilities provide programs not possible in smaller centers. In-service training is most highly valued although it requires specific organization separate from resident or student education and sufficient time for the development of new clinical skills and understanding.

It was the group's opinion that didactic lectures are of limited value; emphasis was put on the need for open forums and small discussion groups. Direct participation in clinical sessions was looked upon as offering the most potential in educational programs—and was the factor most lacking. The cost factor is almost prohibitive for this individualized training, but its value as a goal must stimulate further efforts to attain it.

Correspondence courses in specific fields are of great value, although this method of limited application has not been developed to its full potential.

Two-way radio conferences between regional centers or medical schools and other hospitals were enthusiastically endorsed. While not replacing direct clinical contact, they could introduce non-participating physicians to a more balanced program of continuing education. They were considered superior to taped programs. Television, while more costly, was looked upon as having clearly greater teaching potential than two-way radio.

Outstanding research scientists lecturing in post-graduate courses often include details unrelated to medical practice and uninteresting to the registrant. However, an understanding of research applications is essential for both specialist and generalist to understand new aspects of clinical importance. Programs more specifically devoted to research were felt to be of greater use to the specialist, but general practitioners welcomed them also.

The physicians' continuing education was considered the responsibility of the professional group itself, and other groups should act only as spark-plugs in the development of new programs. Education should be prefinanced, possibly by increased dues allocated specifically for this purpose by organized medicine. This would permit physicians who have recently begun in medical practice to continue their educational pursuits. Those wishing further and more exacting training should be considered as students, financing the extended education either on their own or through fellowships, scholarships and loan funds.

The conference emphasized that the physician is responsible for his own continuing education. Some professional organizations such as the American Academy of General Practice already have made regular attendance at accredited local and university sponsored programs a condition of membership. If physicians are to avoid some re-licensing requirements, it was felt imperative that organized medicine follow this lead. Since membership in county medical societies is professionally essential for the vast majority of physicians, such a condition could be appropriately proposed by these bodies. Many hospitals have meetings that must be attended by physicians as a condition of the use of the hospital facilities, and many physicians participate in the hospital staff audit systems. Continuing education is of at least equal importance and can be viewed in the same light.

Conclusions

The conference unanimously agreed that expansion of continuing education for the physician is essential if the highest standards of medical care are to be achieved. Specific aspects for further consideration included:

1. Programs in the community, at regional centers and medical schools require further development and coordination.

2. County medical societies might effectively become the coordinators between hospitals and teachers, developing such new activities as "consultant-in-residence" programs.

3. In the less populated areas, regional coordinating centers should be developed, containing adequate libraries, films and teaching facilities.

4. Programs at medical schools must be expanded to include in-service training as well as more individualized instruction.

5. Television and radio programs should be developed, and audio-taped material and correspondence courses used more fully.

6. Clinic and operative sessions are of the greatest value, with open forums, discussion groups and overall reviews next on the scale of importance. Didactic teaching is of limited usefulness.

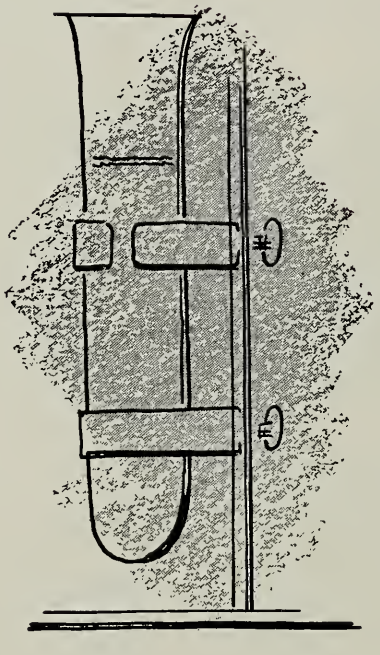
7. Courses on new developments in concepts of disease, techniques and means of therapy are valued more by the specialist but also by the general practitioners. Courses dealing solely with current research should be concise.

8. Cost should be a primary responsibility of the physician and organized medicine; pilot projects supported by government, foundation and private funds should be the extent of outside assistance.

9. Organized medicine should accept the responsibility of insuring that all member physicians participate in accredited programs of continuing education.

The conference closed with a unanimous recommendation that further meetings of this type be held at regular intervals.

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Environmental Carcinogenesis

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MANY PHYSICIANS now in practice may recall textbook references to bizarre forms of cancer that resulted from exposure to certain unusual environmental conditions. For example: Kangri cancer due to carrying hot coals against the abdominal wall, Pott's cancer of the scrotum among chimney sweeps exposed to soot in the early days of the industrial revolution, or Bilharzia cancer of the bladder among Egyptians resulting from infection with Schistosoma hematobium. However, consideration of these rare forms of cancer occurring in distant lands and other times may actually tend to obscure the significance of environmental carcinogenesis in the cancer problem as a whole.

During the past 20 years the existence of environmental factors in the origin of cancer of the skin, lung, and bladder as well as other sites of cancer and leukemia has become much clearer. Far from being a rare phenomenon, initiation of cancer by environmental agents may be the most common pattern of origin of cancer. Probably the greatest stimulus to this idea has been the demonstration by epidemiological research and other investigations that cigarette smoking is responsible for the phenomenal increase in lung cancer. Already the leading site of fatal cancer in men in the United States, the lung is becoming a frequent site of cancer in women as well—due to cigarette smoking. Many other agents to which man exposes himself are likewise being recognized as cancer producing.

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To assist in understanding the nature and extent of environmental carcinogenesis, it may be useful to examine it from the standpoints of:

1. Universal exposure, as in the case of sunlight or atmospheric pollution;
2. Selective exposure of groups of persons, such as those eating certain types of food, or those engaged in certain occupations, or those treated for disease by certain techniques; and
3. Personal exposure, for example, to various forms of tobacco usage.

Consideration of the problem from these three standpoints may suggest types of control measures to be introduced as knowledge accumulates.

A fourth type of environmental exposure which deserves attention in the light of recent knowledge is the possible transmission of virus as an etiologic factor in cancer.

Universal Exposure

Exposure to sunlight, which induces skin cancer especially in light-complexioned Caucasians, is perhaps the most ubiquitous environmental cancer-producing situation. Cancer of the skin occurs much more commonly in the southern part of the United States than in the northern part. Moreover, solar radiation in the 2,900-3,200 A range[1] has been experimentally demonstrated to be carcinogenic.

Atmospheric pollution by radioactive materials is another clear-cut example of exposure of entire populations to a carcinogenic agent. In this case the population of the entire world has been exposed due to man's deliberate action leading to contam-

ination of the atmosphere. The increased incidence of leukemia among survivors of Hiroshima and Nagasaki is now well established. Beyond the confirmation of radiation-induction of leukemia, perhaps the most significant aspect of the Japanese studies is the body of evidence that there is no "safe" exposure below which leukemogenesis never occurs.[12] In the radiation-induction of leukemia all the evidence indicates that the greater the amount of exposure to radiation the greater the likelihood of leukemia, and the less the exposure the less the likelihood. This concept is important to grasp, especially for persons, including physicians, who have been trained to think in terms of minimum effective and maximum safe doses. It is particularly important in the light of the following statement from the United States Department of Health, Education and Welfare:

"The non-threshold concept has been adopted as a basic assumption for planning purposes by the United States government and the many national and international scientific organizations. It is the basis for U.S. policies and programs for the assessment of radiation hazards, and for control measures designed to limit exposures of large population groups."[19]

It is appropriate to ask how many cases of leukemia are expected to arise from radioactive fallout due to the testing of atomic weapons which has already been carried out. Many estimates have been made, a conservative and official one being that of the Federal Radiation Council. That agency's report on the health implications of fallout from nuclear weapons testing through 1961 (and we have had more testing since that time), on the basis of certain conservative assumptions, includes the statement:

"In the period of an average life span of 70 years, the average lifetime exposure to fallout could be expected to result in a total of up to 2,000 cases of leukemia (in the population of the U.S.) . . . A corresponding estimate for the number of cases of bone cancer . . . would give an upper limit of 700 cases in 70 years."[7]

Thus the fallout of radioactive debris from atomic weapons testing has already reached the point where official acknowledgment is given to the production of cancer by this means, including estimates of the amount of leukemia and bone cancer in our own U.S. population as well as that of the rest of the world. Statements to the effect that the "average dose" is low, or "similar to radiation from rocks," or various schemes for setting "allowable limits" or "guides" should not be used to obscure the evidence that any amount of radiation may induce leukemia or bone cancer. In this connection it is well to bear in mind that over the very few years of our experience in seeking protection against radiation, the tendency has been to attach significance to lower and lower amounts of radiation. Also there is no known way to reverse the contamination of the atmosphere nor to reverse the biological process leading to cancer once it has been initiated.

Not only radioactive debris but possibly other atmospheric pollutants may carry a cancer hazard. Several pieces of evidence suggest that the atmospheric pollution of large cities may be a factor in lung cancer. In general, the larger the city the more the lung cancer. Even allowing for the fact that cigarette smoking is more common in cities, there is still substantially more lung cancer in cities than in rural areas. For example, the American Cancer Society study[8] disclosed that even after taking into account the difference in cigarette smoking habits there was a one-third excess of lung cancer among residents in cities with more than 50,000 residents than in residents of rural areas. Furthermore an investigation[6] of migrants to New Zealand from England showed an excess of lung cancer among the migrants. The investigator concluded that exposure to air pollution in English cities was responsible for the excess.

Chemical studies likewise indicate that air pollution may be a factor in lung cancer. Both in England and in the United States chemical analysis of the air has disclosed the presence of 3, 4, -benzpyrene, one of the most potent carcinogens known.[16] Not only hydrocarbons but possibly also heavy metals and other substances may be present in the air of our larger cities in sufficient quantity to be carcinogenic.

Finally, some evidence suggesting community air pollution as a factor in lung cancer comes from the experimental production of cancer in animals. Investigators[10] have now isolated from the air of several U.S. cities substances that cause cancer when applied to small animals.

However, the question remains whether these substances are present in a form and amount that can cause lung cancer when air containing them is breathed by man. Air pollution varies from place to place and time to time depending mainly on the types of fuel used and other technologic aspects of industry. The biological consequences of breathing London air polluted with coal smoke may be quite different from those of breathing, say, Los Angeles smog which results mainly from oxidation of unburned hydrocarbons in automobile exhaust. In any event, it is desirable that public health agencies, universities and other appropriate groups increase their studies to ascertain whether and to what extent air pollution is involved in lung cancer. Changes in motor vehicle exhaust and other sources of com-

munity air pollution resulting from new technologic developments could expose millions of persons to carcinogenic hazards that are as yet unrecognized.

Selective Exposure of Groups of Persons

As an indication of the carcinogenic hazard to a selected population resulting from the current rapid and profound alterations in our environment, it may be useful to mention an actual epidemic of cancer that occurred in the western part of the United States during the spring months of 1960. Tens of thousands of cases of liver cancer suddenly appeared in a population in which the disease had been extremely rare during previous years. Fortunately the population consisted of hatchery-raised trout rather than human beings. Investigation disclosed that the outbreak resulted from a change-over to an artificial dry feed, which had been introduced on a wide scale in the interest of economy and efficiency after a year or two of trial. Economy and efficiency are usually the reasons for introducing technological changes, including those in the production of food. When one considers the greatly increased use of physical and chemical agents in the process of bringing food to the table, and the fact that we know so little about carcinogenesis, it is a wonder that we have escaped thus far from mass exposure to cancer producing agents—if we have escaped. In the instance of the trout, the liver cancer occurred a few months after exposure; experience with carcinogenesis in man indicates a lag of years or even decades between exposure to the agent and occurrence of disease.

Exposure of men to a great variety of carcinogenic substances occurs at their place of work. Well known to physicians is bladder cancer resulting from occupational contact with aromatic amine dyes. Such cases began to occur in country after country ten or 20 years after the establishment of the aniline dye industry.[9] It appears that Beta-naphthylamine is only the most potent of a series of carcinogenic compounds used in the industry. In addition to the evidence from human exposure, experimental production of cancer in animals has added to the knowledge that amino dyes may be carcinogenic. Before extending the use of such compounds—for example, butter yellow to color foodstuffs—careful consideration should be given to their carcinogenic potential.

Of special interest to the medical profession as an example of selective exposure to a carcinogenic agent is the high rate of death from leukemia among radiologists. This represents one of the most ironic aspects of carcinogenesis; a group of physicians have unwittingly exposed themselves to a cancer hazard during the development of a means of cancer control, namely, radiology. The fact that radiologists have been exposed to an occupational cancer hazard has been well recognized only the past decade or two.[13,14] Because of past exposure radiologists will continue to die at a high rate from leukemia for many years, no matter what protective measures may be adopted as a result of growing knowledge.

"This situation illustrates all too well the usual features of occupational cancer: delayed recognition of the problems; relatively small group (radiologists) within an occupational class (physicians) seriously affected; uncertainty as to the critical level of exposure which should serve as the guide to preventive action; continued death for many years among exposed persons, even after protective measures are taken."[2]

One could cite many more examples of exposure to carcinogens inherent in particular work situations such as bone sarcoma among watch-dial painters, lung cancer among chromate-ore workers, and cancer of the skin and scrotum among workers exposed to various fractions of petroleum. It is clear that such situations are by no means rare.

Another type of selective exposure to carcinogenic agents and again one of particular interest to practicing physicians, is the therapeutic use of x-radiation. As shown by Court-Brown and Doll,[4] patients treated by x-radiation for ankylosing spondylitis subsequently developed leukemia at a remarkably high rate. The United Nations Scientific Committee has considered the problem of hazards of medical uses of radiation sufficiently important to issue a special statement on the subject.[18]

Personal Exposure

Thus far, attention has been given to environmental carcinogenesis for which agencies apart from the individual are responsible, for example, governments, industry and physicians. In addition one must consider exposure to hazards growing out of personal habit.

Here the outstanding example is tobacco smoking. For many years physicians recognized that cancer of the lip and mouth could result from pipe-smoking. However, such cases were relatively few and often controllable by therapy.

During the past several years evidence has accumulated that cigarette smoking is a causative factor, in fact the major factor, in the phenomenal rise in lung cancer. A rare disease only a few decades ago, it now is the cause of more than 35,000 deaths annually in the United States. If present trends continue, more than one million United States children now of school age will die of lung cancer before reaching the age of 70.

Apparently we tolerate this most remarkable disease phenomenon of our times because the lung cancer epidemic has been so insidious and because the individual case occurs decades after the start of self-exposure. The Royal College of Physicians of London has recently reviewed the evidence and made a series of recommendations:[15]

"1. More education of the public and especially school children concerning the hazards of smoking;

"2. More effective restrictions on the sale of tobacco to children;

"3. Restriction of tobacco advertising;

"4. Wider restriction of smoking in public places;

"5. An increase of tax on cigarettes, perhaps with adjustment of the tax on pipe and cigar tobaccos;

"6. Informing purchasers of the tar and nicotine content of the smoke of cigarettes;

"7. Investigating the value of anti-smoking clinics to help those who find difficulty in giving up smoking."

In the United States we appear to be still in the stage of assembling committees to review the evidence. The urgency of the lung cancer situation may be measured by the more than 35,000 deaths it already causes in the U.S. population each year; by the increasing mortality rate from the disease—it doubled from 1930 to 1940, doubled again from 1940 to 1950, and almost doubled again from 1950 to 1960—and by the fact that present means of treating lung cancer do not offer promise as a major control measure. The time may not be distant when the medical profession and public health authorities of this country will recognize the urgency of the situation and exercise leadership in coping with the problem.

Virus Aspects of Cancer

It is possible despite all of the attention given to physical and chemical agents as carcinogens that viruses will yet prove to be more significant factors in carcinogenesis.

Stanley remarked in 1956:[17] "The recent findings in the virus field indicate more and more that the virus problem and the cancer problem are one and the same. The experimental evidence now available is consistent with the idea that the viruses are the etiologic agents of most, if not all, cancer, including cancer in men." Although this seemed a bold statement only six years ago, developments in virology and cancer research since that time have yielded nothing to disprove the statement, and much to support it.

If Stanley's estimate proves correct a new approach to cancer prevention may become clear, including an attack on virus as well as on physical and chemical agents of cancer in the environment.

Implications for Cancer Control

Meanwhile control of cancer-producing physical and chemical agents in the environment is urgently needed.

Such control requires first of all that the agents be identified. Recent advances in epidemiological and laboratory investigation of cancer have yielded a considerable amount of specific knowledge concerning environmental carcinogenesis—only a small portion of which could be mentioned in this paper. Furthermore, these advances have given rise to expectation that the ultimate solution of a great portion of the cancer problem will come through control of cancer hazards in the air we breathe, the food we eat and the things we touch.

Once the responsible agents have been identified, it is necessary to develop the means of controlling them. Often this requires new or modified technologic facilities. The potent carcinogen *benzpyrene* has been found in the soot of British cities,[20] in cigarette smoke[3] in exhaust of petroleum fuel of automobiles in Los Angeles[11] and in snow around factories in Leningrad.[5] Satisfactory means have yet to be developed for removing benzpyrene from any of the environmental situations cited in which it may be proved to be a cancer hazard.

After the technological problem is solved, social action will often be required to put the solution into effect. For example, it may be necessary to develop the will and the means to deal with the economic problems arising in industry as a consequence of steps to prevent occupational cancer. Undoubtedly, major economic, social and political factors must be taken into account when the necessary broad social action is undertaken to control cigarette smoking.

However, we may be confident that in the long run the health protection aspect will prevail as the decisive element in social action regarding cancer hazards in our environment, just as health protection prevailed as the decisive element in the social action necessary to control the bacteriological and the physical exhaustion hazards of a century ago.

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REFERENCES

1. Blum, H. F.: Sunlight and cancer of the skin, J. Nat. Cancer Inst., 1:397, 1940.

2. Breslow, L.: The prevention of cancer, Cancer, VI, Butterworth and Company, Ltd., 1960.

3. Campbell, J. M., and Lindsey, A. J.: Polycyclic hydrocarbons extracted from tobacco: the effect upon total quantities found in smoking, Brit. J. Cancer, 10:649, 1956.

4. Court-Brown, W. M., and Doll, R.: Special report medical research council 295, London, H. M., Stationery Office, 1957.

5. Dikun, P. P., Shabad, L. M., and Norkin, V. I.: Nekotorye novye dannye o zagriaznennosti atmossey promy-Shlennykh torodov, benztirenom, Gig. & San., 21:6, 1956.

6. Eastcott, D. F.: The epidemiology of lung cancer in New Zealand, Lancet 37, Jan. 7, 1956.

7. Federal Radiation Council: Health implications of fallout from nuclear weapons testing through 1961, May, 1962.

8. Hammond, E. C., and Horn, D.: Smoking and death rates—report on 44 months of follow-up of 187,783 men, J.A.M.A., 166:1294, 1958.

9. Hueper, W. C.: Recent developments in environmental cancer, Arch. Path. (Lab. Med.), 58:360, 1954.

10. Kotin, P., and Falk, H.: The role and action of environmental agents in the pathogenesis of lung cancer, I, air pollutants, Cancer, 12:147, 1959.

11. Kotin, P., Falk, H., and Thomas, M.: Aromatic hydrocarbons, II, presence on particulate phase of gasoline engine exhausts and carcinogenecity of exhaust extracts, Arch. Industr. Hyg., 9:164, 1954.

12. Lewis, E. B.: Leukemia and ionizing radiation, Science, 125:965, 1957.

13. Lewis, E. B.: Leukemia and ionizing radiation, Science, 125:968, 1957.

14. March, H. C.: Leukemia in radiologists in a 20-year period, Amer. J. Med. Sci., 220:282, 1950.

15. Royal College of Physicians of London: Smoking and Health. Summary and Report on Smoking in Relation to Cancer of the Lung and Other Diseases, Pitman Medical Publishing Co., Ltd., London, 1962.

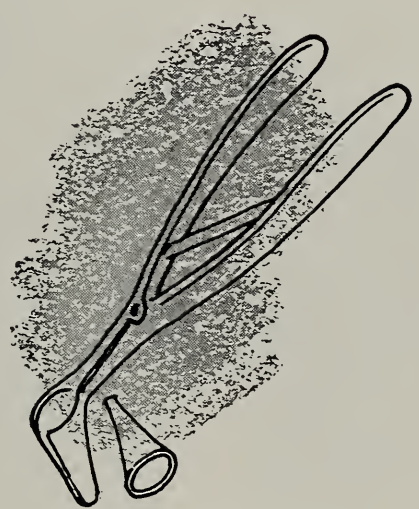
16. Sawicki, E., Elbert, W. C., Houser, T. R., Fox, F. T., and Stanley, T. W.: Benzo/a/pyrene content of the air of American communities. Presented at the American Industrial Hygiene Association meeting, Rochester, N.Y., April 17, 1960.

17. Stanley, W.: The Virus Etiology of Cancer, Proceedings of the Third National Cancer Conference, J. B. Lippincott Co., Philadelphia, Pa., 1956, pp. 42-49.

18. United Nations Scientific Committee: The effects of atomic radiation. The responsibilities of the medical profession in the use of x-rays and other ionizing radiation, J. Nat. Cancer Inst., 18:481, 1957.

19. U.S. Dept. of Health, Education and Welfare: Fallout Surveillance and Protection, a Background Statement, Washington, D.C., Oct. 26, 1961.

20. Waller, R. E.: British Empire Cancer Campaign. Twenty-eighth annual report, British Empire Cancer Campaign, London, 1950, p. 99.



CASE REPORTS

Pregnancy After Bicuspidization of Aortic Valve for Severe Aortic Insufficiency

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THE CASE here reported is believed to be the only one in which a patient who had had correction of aortic insufficiency by the bicuspidization method had a normal pregnancy and parturition.

The patient, a 26-year-old white married woman, had an undiagnosed acute febrile illness at age five years. At age 13 and again at 18 she had had acute rheumatic fever with congestive failure. Therapeutic abortions were done in 1955 and 1957. (The patient had decided against sterilization although it had been approved by a hospital staff therapeutic abortion committee. She had been reading articles in the lay press regarding surgical correction of rheumatic valvular disease and had continued a hope that a successful procedure would be developed for correction of aortic insufficiency.)

The patient had had progressive cardiac enlargement and increasing peripheral signs of aortic insufficiency. She had anginal symptoms with pain in the left chest radiating to the left arm and forearm and increasing dyspnea on exertion. Her activities were restricted, she was following a low-sodium diet and was receiving digitalis therapy.

The blood pressure was 165/30 mm of mercury. On auscultation grade III aortic systolic and diastolic murmurs and grade II apical systolic and diastolic murmurs were heard. The apical impulse was heaving. From x-ray films the transverse diameter of the heart was computed at 151 mm in June 1957. In April 1959 it was 161 mm. Results of cardiac catheterization studies were compatible with aortic regurgitation.

On October 9, 1959, surgical repair of the aortic valve was done by the bicuspidization method. Recovery was uneventful.

After recovery, the blood pressure was 120/80 mm of mercury, peripheral signs of aortic insufficiency were no longer present and the transverse diameter of the heart appeared to be 143 mm. Grade III systolic and grade I-II diastolic murmurs were heard in the aortic region and a grade II systolic murmur at the apex. Tolerance for exercise increased to within normal limits, and digitalis therapy was not necessary, nor was sodium restriction in the diet.

The patient was first examined for pregnancy on November 30, 1962. The last menstrual period was October 13 and the expected date of confinement was July 20, 1963. Although it was believed she would tolerate pregnancy well, for want of experience with similar cases it was decided to make the following restrictions: She was to rest 30 minutes twice a day after the 24th week, to ingest no more than two grams of sodium daily and to have weekly examinations after the 28th week.

The patient cooperated well at all times. Body weight was 133 pounds at the beginning of pregnancy and at term was 133½ pounds. Pregnancy, labor and delivery were uneventful.

Labor started spontaneously July 25, 1963. On arrival at hospital at 12:40 a.m. she was given 100 mg of meperidine and a caudal anesthetic. She was kept in the semi Fowler position, and oxygen was given by mask at six liters per minute even though she was asymptomatic. At 2:20 a.m. the bulging amniotic sac was ruptured. Labor progressed rapidly. No pushing was permitted during labor or delivery. At 4:31 a.m. right mediolateral episiotomy was done and a 6 pound, 8 ounce normal boy was delivered with outlet forceps. Pitocin was used instead of ergot after delivery of the placenta. Ambulation was not allowed until 24 hours postpartum and she was kept in the hospital five days after delivery. Resumption of a normal sodium diet

Submitted February 24, 1964

was permitted ten days after the patient returned home. She breast-fed the baby and at the time of this report (January 23, 1964) was still doing so. Also she was carrying out her normal duties as a housewife.

Summary

A patient who became pregnant after bicuspidization for severe aortic insufficiency had no abnormal difficulty during pregnancy, at delivery or afterward.

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More Observations on Relief of Aphthous Stomatitis on Resumption of Cigarette Smoking

A Report of Three Cases

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ANY PHYSICIAN who has treated aphthous stomatitis knows how difficult a problem it may be in some patients. In 1960 Brookman[1] reported four patients in whom chronic aphthous stomatitis was associated with the sudden cessation of cigarette smoking and relieved by resumption of smoking. Similar or related phenomena were noted in the following three cases.

Reports of Cases

CASE 1. The patient, a 27-year-old man, had been a heavy smoker for years. When first seen on November 13, 1962, he had seven large aphthae on the oral mucosa and on the tip and sides of the tongue. He had not been free of such lesions for the preceding six months. As a professional singer he was alarmed by the lesions since they posed a threat to his career.

Six months previously he had stopped smoking abruptly. Within two days he had a severe attack of herpes simplex on the lips and a few days after that the first of a series of deep painful aphthae involving the inside of the mouth developed. During the ensuing six months the number and severity of the lesions had increased until he was never without a half dozen or more of them at any time. He had fever daily and had constant painful swelling of cervical lymph nodes.

The patient was advised to start smoking again. Within a week he was free of aphthae and he remained free of them during a three-month period of follow-up. The patient then moved to an unknown address.

Of itself, the relationship between the cessation of cigarette smoking and the onset of very severe aphthous stomatitis and herpes labialis in this case might not be considered important, but taken with the clearing of the lesions of the mouth within days after cigarette smoking was resumed, it becomes a striking phenomenon. Although it is not known whether the remission lasted and there was no opportunity to test further what effect discontinuing smoking again might have, the necessarily meager observations would seem to accord with Brookman's.

I do not consider phenomena of the kind here reported to be common—but severe chronic aphthous stomatitis is not a common disease. In the present case the patient had the most severe and the most chronic aphthous stomatitis I had seen in almost ten years of dermatologic practice. To see so difficult a problem resolved so quickly was a distinct surprise.

Although the following two cases are not examples of chronic and severe aphthous stomatitis, they entailed side effects that appeared to be brought on by cessation of cigarette smoking. In one of them the occurrence of urticaria along with symptoms referable to the throat was of particular interest to me, for I have long suspected that in some patients urticaria and eczema may be brought on by the cessation of cigarette smoking. These two cases are reported to call attention to the possibility that side effects other than that reported by Brookman may follow the discontinuance of smoking.

CASE 2. A 40-year-old woman who had been a moderately heavy smoker for years stopped smoking abruptly and the next day her throat became inflamed and sore. The patient noted small areas of ulceration scattered throughout her mouth and throat. She also had a low grade fever, malaise and cervical lymphadenopathy. After a week of these symptoms, a severe attack of herpes simplex of the lips developed. The herpes and the sore throat cleared in about a month, then after a week or so the throat syndrome and herpes recurred. An otolaryngologist diagnosed virus infection of the throat. The patient was advised to stay in bed a few days and to take aspirin. The herpes cleared but the symptoms referable to the throat persisted. When I examined her in the fourth week of the

Submitted December 19, 1963

recurrent attack, the oral temperature was 99°F. There was mild urticaria of the face and upper chest, six tiny white areas of ulceration of the oropharynx and enlargement of cervical lymph nodes. Because of the vagueness of the disease, a diagnosis of virus pharyngitis was made. Oral cortisone and tetracycline antibiotics were prescribed and the patient became afebrile but the sore throat persisted. The patient then asked if the condition could be related to her quitting cigarettes. Thinking that it might be, I suggested she begin again to see what would happen, but this she did not wish to do. As she was concerned with a gain in weight since she had stopped smoking, I prescribed a daily dosage of 10 mg of Dexamyl® for the control of appetite and discontinued all other therapy. Relief of the sore throat and urticaria was almost instantaneous.

In the succeeding two months the patient took Dexamyl and had no recurrence of urticaria or of the throat syndrome. When she stopped taking the compound she had mild recurrence of the throat syndrome immediately, but it cleared spontaneously in a few days. Then after about two weeks she had another mild recurrence of the throat soreness with lymphadenopathy and fever, but this, too, cleared spontaneously. Thereafter during ten months of observation she had no symptoms referable to the throat although she did not resume smoking or taking Dexamyl.

CASE 3. The patient, a 40-year-old woman, had been a moderate smoker for years. On September 21, 1962, she abruptly cut her smoking to six cigarettes a day. Within two days severe herpes simplex of the lips and aphthae of the mouth developed. The patient had a low grade fever every afternoon, felt tired and weak, had difficulty concentrating on her work and difficulty in talking. When I examined her approximately six weeks after the onset of symptoms, she had moderate cervical lymphadenopathy and 10 to 15 tiny white ulcers in the oropharynx. Meprobamate, 1200 mg daily, was prescribed. A month later, two months after the onset of disease, the patient was no better. At my suggestion she returned to smoking her usual number of cigarettes. Within two days the throat soreness was completely relieved. She remained symptom-free for the ensuing year, continuing to smoke during that time. No attempt was made to reproduce an attack of the throat syndrome by having her stop smoking abruptly.

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REFERENCES

1. Brookman, R.: Relief of canker sores on resumption of cigarette smoking, Calif. Med., 93:235-236, October, 1960.

*A mixture of dextroamphetamine sulfate and amobarbital.

Tarsal Tunnel Syndrome Pain Abated by Operation to Relieve Pressure

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THE ENTITY known as the tarsal tunnel syndrome, although previously postulated by other investigators,[1-3,6-8] was first described by Keck[3] in January 1962. In examining some 2,500 recruits at Fort Hood, Texas, Keck found four cases of this condition, in one of which dramatic relief was brought about by section of the laciniate ligament and decompression of the posterior tibial nerve. In December 1962 Lam[5] described another case of tarsal tunnel syndrome. Both Keck and Lam expressed belief that this is a much more common condition than would appear from the sparse literature on the subject. The purpose of the present communication is to add a report of another case with some additional observations.

The posterior tibial nerve is the major terminal branch of the sciatic nerve. In the space between the medial malleolus and the Achilles tendon it is covered by the laciniate ligament. Under the laciniate ligament the posterior tibial nerve divides into the medial and lateral plantar nerves. The medial plantar nerve, like the median nerve in the hand, is sensory to three toes and part of another—great toe, the second, third and the medial aspect of the fourth—and the skin of the sole of the foot on the medial side. The lateral plantar nerve is sensory to the little toe and the lateral aspect of the fourth, and also to the skin on the lateral side of the sole of the foot. The space between the medial malleolus and the Achilles tendon is occupied by the posterior tibial tendon, in its own sheath, the flexor digitorum longus, in its own sheath, the posterior tibial artery with two venae comitantes, the posterior tibial nerve and the flexor hallucis longus.

Submitted February 20, 1964.

From the Plastic Surgery Department, St. Mary's Hospital, San Francisco.

Presented at the Annual Meeting of the California Society of Plastic Surgeons, Yosemite, California, April 25, 1963.

Pressure on the posterior tibial nerve may be caused by thickening of the laciniate ligament or by gouty or arthritic deposits around the ankle joint. The symptoms of such pressure are pain or paresthesia over the sole of the foot, and pain is frequently referred to the calf and up the leg. Loss or diminution of sensation over the sole of the foot and toes may be noted on examination. The pain may be reproduced by pressure on the posterior tibial nerve. The Valleix phenomenon or nerve trunk tenderness proximal or distal to the area of compression may be present. Pain may be worsened by plantar flexion which puts stretch tension on the posterior tibial nerve under the tight ligament.

I would like to emphasize that pain in the foot and calf, sometimes referred up the leg,[6] is rather common and may imitate root pain of spinal origin. Indeed, in the case herein reported three operations were done on the back for decompression of the spinal nerve at its root. Another point to be emphasized is the frequent association of the condition with arthritis and gout. The mechanism producing the pressure on the posterior tibial nerve has been likened to the similar and better known carpal tunnel syndrome in the palm.

Report of a Case

The patient, a 36-year-old housewife whose chief complaint was of pain in the right leg and ankle for two to three years, had rheumatoid arthritis and spondylitis with continual pain in the low back and radiating down the back of both legs. Those were the circumstances when I examined her in February 1963. Cluneal nerve syndrome had been diagnosed previously and she had had three separate operations on the back without permanent relief. Pain in the right leg had become progressively worse since November 1962. The patient also had pain over the dorsum of the right foot that was aggravated by ankle extension, less so by dorsi-flexion. Arthritis involved the shoulders, wrists, spine and ankles.

Two operations on the back for decompression of the spinal nerve had been done in 1960 and another in December 1962. The patient had had hysterectomy, oophorectomy and splenectomy in 1957, appendectomy and tonsillectomy when she was much younger. She had had rheumatic fever in the past without complications. Pain of the kind complained of could be reproduced on plantar flexion of the right ankle. This pain radiated up to the calf of the leg. On neurological examination diminished sensation over the medial aspect of the foot and toes was noted. Pulses were good.

At operation a vertical incision to the depth of the subcutaneous tissues was made between the medial malleolus and the heel-cord. The laciniate ligament over the posterior tibial nerve and vessels was found to be quite thickened. It was divided throughout its entire width and the neurovascular bundle herniated through the defect. The gross appearance of the nerve gave no indication of abnormality. Pressure was such that the divided ligament could not be re-approximated. A small strip of ligament was removed for pathological examination.

The pathological report was as follows: The specimens were segments of laminated, fibrocollagenous tissue resembling tendon sheath with an outer surface covered by a narrow segment of loculated, hyperemic adipose tissue. These tissues were without significant inflammatory cell infiltrate while the sheath itself appeared somewhat thickened, rather densely hyalinized and fibrous, but was otherwise without specific identifying features, and there is no significant inflammation, granuloma formation or other process noted. The findings were consistent with a diagnosis of fibrosis of tendon sheath in the right ankle region.

Although the pathologist's observations were indeed consistent with fibrosis of tendon sheath, the actual tissue examined was fibrosed and thickened laciniate ligament.

The patient had no further complaint of pain in the foot or calf, and sensation returned to near normal in four months. She could drive her car, which previously she could not do because stepping on the brake or accelerator was too painful.

Summary

In a case of tarsal tunnel syndrome, pain in the foot and ankle was dramatically abated by division of the laciniate ligament and decompression of the posterior tibial nerve.

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REFERENCES

1. Clark, K.: Peripheral nerve injuries associated with fractures, Postgrad. Med., 27:476-479, 1960.

2. Fahlund, G. T. R.: Suture of the posterior tibial nerve below the knee, with a follow-up study of the clinical results, J. Neurosurg., 3:223-233, 1946.

3. Keck, C.: The tarsal-tunnel syndrome, J. Bone & Joint Surgery, 44A:180, Jan., 1962.

4. Kopell, H. P., and Thompson, W. A. L.: Peripheral entrapment neuropathies of the lower extremity, N.E.J.M., 262:56-60, 1960.

5. Lam, S. J. S.: A Tarsal-Tunnel Syndrome, Lancet 2, 1354, 1962.

6. Pollock, L. J., and Davis, Loyal: Peripheral nerve injuries, Am. J. Surg., 18:361-401, 1932.

7. Roaf, R.: Suture of the external and internal popliteal nerves, British J. Surg., 33:382-385, 1946.

8. Ward, W. C.: Posterior tibial nerve injuries, Southern Surgeon, 14:124-129, 1948.

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EDITORIAL

Relative Value Studies—1964

By early December all members of the California Medical Association will have received copies of the Fourth Edition of the Relative Value Studies pioneered by CMA in 1956.

The initial edition eight years ago was embraced not only by CMA members but by governmental agencies, insurance carriers and physicians throughout the country. A number of state medical associations followed California's lead and produced RVS's of their own, patterned on and frequently copied in whole or in part from this publication.

A second edition followed the first, in 1957, and the current edition came out in 1960. The 1964 version thus carries on the pioneering work that was started in 1956 and is now receiving acclaim from all interested parties.

The forthcoming edition of this work will appear in five sections rather than the four divisions previously used. Anesthesiology has been made a separate section so that the distinct differences in operating costs or overhead between that specialty and other fields of practice may be more adequately identified. This section does not change the formula for computing anesthesia values and allowances and does not, with few exceptions, change the basic allowances which have appeared in the current RVS edition.

In the medicine section the new RVS edition has added new services, including a description of "health supervision," which is a frequent service in pediatric care. Items have also been added to reflect the changes taking place in the field of cardiology and pulmonary physiology. Changes have been made in the format of physical medicine, to reflect medicine's awareness of rehabilitative procedures as distinguished from what was formerly identified as physical therapy.

The section on surgery, largest in the publication, includes a broader listing of procedures, especially in the field of cardiovascular surgery. This portion also contains information derived from a study of fees for surgical assistants. A survey to determine the usual level of these fees was conducted under a resolution approved by the 1963 House of Delegates.

Under radiology the new RVS adds a number of procedures involving injection and placement of radioactive materials. The laboratory section adds new procedures in keeping with laboratory developments in the past few years.

Wrapping up the entire edition is an expanded, comprehensive index designed to facilitate the location of any procedure listed in the studies. Cooperating in the production of the index was the Health Insurance Council, an organization representing the underwriters of more than 90 per cent of the commercial health insurance coverage in the country.

More than 2,000 physician services are listed in the new volume, an increase of more than 200 over the third edition.

A foreword again cautions the user of the Relative Value Studies that this is not a fee schedule, that it must not be used as such and that the values shown in one section of the publication cannot be used in other sections with accuracy or propriety. Also a part of the instructions for using the RVS is the original committee report rendered in 1956 and still considered appropriate by the Committee on Fees which has produced the current edition.

The Fourth Edition of the Relative Value Studies culminates the work of this committee over the past two years. During this time more than 3,000 physician-hours have been devoted to this publication, plus uncounted hours of clerical and staff time.

Consultation and actuarial assistance have been liberally used so that all specialties and all segments of the medical profession could be adequately represented.

Net result of all this endeavor will be the Fourth (1964) Edition of the Relative Value Studies of the California Medical Association. From a small beginning in 1956 this publication has assumed massive importance today, only eight years later. From this point forward it is hoped that an accurate format will be developed whereby revised editions may be issued at two-year intervals. While the relative values of individual procedures may not be expected to change greatly in a span of two years, the ever-advancing practice of medicine demands that these studies be kept up to date by constant surveillance. The volume thus becomes a storehouse of medical services reflecting the manner in which medicine is practiced today. Succeeding editions will include the addition of new services and the discard of obsolete practices, even as this Fourth Edition strives to bring nomenclature and procedures up to date.

As with the earlier editions of this study, a copy will be sent to each member of the California Medical Association as soon as the volume comes off the press. Additional copies for members or for others interested will again be available through Six Ninety Three Sutter Publications at that address in San Francisco.

The thanks of the officers, Councilors and members of the California Medical Association are due the members of the Committee on Fees for their great contribution in producing this publication. Their time and interest alone have made possible this new edition, which appears destined to follow its predecessors as a "best seller" in medical, insurance, sociological and governmental circles.

What So Innocuous as Iron?

"Anemia" is not a disease, but merely a sign produced by a variety of disorders. Since therapy which effects remission of one anemia may not help with another, the alert physician attempts to diagnose and treat the underlying disorder rather than treat the anemia itself. Yet we see many anemic patients treated with iron, sometimes for prolonged periods, without proof of iron deficiency. Therapeutic trial with iron wears a halo of respectability. After all, what is so innocuous as iron?

Prolonged therapeutic trial involves real danger for some patients, however, quite aside from the delay which it may cause in the recognition and treatment of other disorders. The human body possesses an imperfect mechanism for controlling iron absorption, and no mechanism for excreting the excess. Persons with normal iron stores absorb only a small fraction of the iron in their normal diet. When dietary iron increases, the total absorbed also increases. If the intake becomes very large, the amount absorbed exceeds the need, and the tissues store the excess. Injected iron likewise accumulates in the tissues.

In recent years, increasing evidence[3] indicates that prolonged therapeutic use of iron-containing preparations may produce secondary hemochromatosis, often with cirrhosis, diabetes, carditis and even death. The disorder occurs most frequently in anemic patients who are repeatedly given transfusions of blood over many years, but it also may be brought about by excessive amounts of injectable iron preparations.

Increased oral intake of iron remains a less generally recognized but probably more important cause of secondary hemochromatosis. Bothwell[1] reported that from the iron vessels in which they prepare their food and make their beer the South African Bantus daily ingest 50 to 200 milligrams of iron—ten times the Western intake. At autopsy, 4 per cent of Bantu males show evidence of hemochromatosis, many times the incidence in other civilizations. MacDonald[2] reported that hemochromatosis occurs much more commonly among chronic users of iron-rich wines than among nondrinkers. There are even reports of self-medicating pill takers, otherwise normal, who consumed iron preparations over long periods and eventually developed hemochromatosis.

The development of this disease from excessive oral intake of iron is not, however, confined to the Bantus, chronic alcoholics and a scattering of hypochondriacal ferrophages. Both anemia and erythroid hyperplasia of the bone marrow, which occur in a wide variety of hematologic disorders, cause increased absorption of iron from the intestines. The amount absorbed may be increased to

a dangerous excess by therapeutic iron. As Mendel[3] pointed out: "The reports of patients with chronic hemolytic anemia . . . who have been treated unnecessarily and fruitlessly with oral iron and who develop the syndrome of hemochromatosis . . . emphasize the . . . dangers of excessive iron administration."

It is increasingly clear that we should have at least a reasonable presumption of iron deficiency before we prescribe ingestion of iron. Even when such deficiency apparently exists, if prompt response to therapeutic trial does not occur, we should discontinue treatment and carry out intensive diagnostic study. The physician who continues to give iron in these circumstances may be denying the patient the treatment he needs and subjecting him unnecessarily to the hazards of a potentially serious disorder. Once more we see that in the anemias, as in other disorders, proper treatment depends upon adequate diagnostic evaluation.

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REFERENCES

1. Bothwell, T. H.: Iron overload in the Bantu; in Iron Metabolism: An International Symposium Sponsored by CIBA, Aix-en-Provence 1st-5th July, 1963 Edited by F. Gross. 629 pp., 234 illus., 45 marks, Springer-Verlag, Heidelberger Platz 3, 1 Berlin 31 (Wilmersdorf), Germany, 1964, pp. 362-373.

2. MacDonald, R. A.: Wine as a source of iron in hemochromatosis, Nature (London), 199:992-3, August 31, 1963.

3. Mendel, G. A.: Iron metabolism and etiology of iron storage diseases: An interpretative formulation, JAMA, 189:45-51, July 6, 1964.

Honor for Health Director

DOCTOR Malcolm H. Merrill, California state director of public health, was the recipient of a Bronfman Prize for Public Health Achievement at last month's annual meeting of the American Public Health Association. This prize is presented annually to members of the APHA who distinguish themselves in their respective fields.

Doctor Merrill's citation calls attention to his leadership in public health in protecting the state's water, air, food and recreational resources and for his work in chronic disease control, rehabilitation programs, immunization against preventable diseases and fluoridation of water supplies. Unofficially, the prize award committee has stated that Doctor Merrill is the leading state health officer in the United States today.

California physicians have long accepted Doctor Merrill's contributions to the health of California citizens as a part of the splendid performance we have come to expect from his department. It is particularly pleasing to know that his colleagues from across the nation have come to this same conclusion and have recognized his achievements with this, the highest honor the APHA has to confer on public health officials. Our profound congratulations, Doctor Merrill.



The President's Page



Your Medical Assistant— A 'Girl Friday'—*plus*

WHEN I BEGAN my medical practice, a reasonably intelligent girl with a high school education could go to work for a physician and develop on the job into an adequate medical Girl Friday. Of course, some of them were just marking time until they could get married. But some managed to learn enough during working hours over the years to become competent medical assistants.

I doubt if the best of them could start from scratch that way now. Today's medical assistant must be a highly-trained career woman if she is to be of any value to today's physician. Consider the requirements: she must be an office manager, a receptionist, a bookkeeper, a housekeeper and a skilled technician.

In a very practical sense, the medical assistant is also the physician's public relations arm. She is the first person a patient sees in the physician's office and in many cases she sees or talks to the patient more often than he does. She can be of tremendous help to him in building up good will in the community.

The medical assistant must keep up to date on the latest technical and socio-economic advances. For example, she is the one who handles the paper work connected with health insurance plans and, usually, the one who explains to the patient his health insurance coverage.

In short, the medical assistant's job is to see to it that the physician is absolutely free to devote his skill and time to the medical care of his patients. Such a job can be handled only by an efficient, dedicated and thoroughly trained person.

Because of the constantly increasing demands on physicians' services and the rapid advances in medical practice, the medical profession needs many more trained assistants than are available today. The California Medical Association and the California Medical Assistants Association are currently attempting to meet this need.

The CMAA has approximately 2,500 members. It is a professional organization whose goal is to promote the highest professional standards among medical assistants. The CMAA sponsors educational courses throughout the state, assists business and junior colleges in developing training programs and encourages young women to become medical assistants.

Realizing the importance to physicians of obtaining the finest assistants possible, the CMA, through its Liaison Committee to the CMAA headed by Dr. Sanford Feldman, is cooperating with the CMAA, California junior college administrators, the California Industrial Educators Association and other State educators to create a uniform course of training for medical assistants in junior colleges. They have banded together as an ad hoc committee for medical assistant education.

At present, about 20 junior colleges offer courses in medical assistant training. These have been developed by junior colleges with varying degrees of guidance from component medical societies, the CMAA's 44 chapters, and, indirectly, the CMA. In some cases the courses have been organized independently by junior colleges. As a result, there is a considerable lack of uniformity in the courses offered, with resultant differences in quality and certification requirements.

Goal of the ad hoc committee is to draw up a uniform state-wide training course that will be consistent with the medical assistants certification program and acceptable to physicians and the State Department of Education and the Association of Junior Colleges of California. The committee has met twice since June and will continue to meet. Its recommendations will be presented to junior college administrators next March.

The CMA's liaison committee also is conducting a survey among component medical societies to determine the types of placement services available for medical assistants, which services produce the best results and in what ways they can be improved.

I would like to see more physicians encourage their medical assistants to participate in CMAA activities. A stronger CMAA can be of great help to physicians and to medical care in California.

James C. Doyle

California Medical Association

NOTICES AND REPORTS

Resolutions No. 1-63 and No. 35-63, introduced in the 1963 meeting of the House of Delegates, and Resolutions No. 7-64 and No. 86-64, introduced in the 1964 meeting of the House, directed that studies be made and guidelines developed to improve the administration of medical discipline under the Medical Practice Act. Resolution No. 35-63 specifically recommended that incompetence, immoral or unethical behavior injurious to patients, and psychiatric disabilities which interfere with the proper medical management of patients be declared unprofessional conduct.

In 1964, the House of Delegates directed that a study be made particularly of California Senate Bill No. 1514, which proposed the creation of a medical disciplinary board separate from the State Board of Medical Examiners. It also directed that definite programs be developed in the area of incompetence or disability and that the concept of rehabilitation rather than discipline be urged. The Council ad hoc committee was asked "to submit a report of its deliberations to the House of Delegates at least three months prior to its next meeting."

The Council ad hoc committee requested the editor of CALIFORNIA MEDICINE to publish the testimony given by Doctor Carl E. Anderson on behalf of CMA, and by Doctor Justin J. Stein on behalf of the State Board of Medical Examiners, before the Senate Fact Finding Committee on Public Health and Safety on September 22, 1964 and October 13, 1964. It is hoped that not only the delegates but all members of the profession might be interested in reviewing these well-considered proposals.

Problem Areas in Medical Discipline

CARL E. ANDERSON, M.D.*
Santa Rosa

MR. CHAIRMAN and members of the Senate Fact Finding Committee on Public Health and Safety:

I am Carl E. Anderson of Santa Rosa, a practicing physician specializing in the field of orthopedic surgery, and am chairman of the California Medical Association Council, which is its governing body. The opportunity to discuss with you Senate Resolution No. 204 and Senate Bill 1514, and the general topic of medical discipline, is appreciated. This presentation has been authorized by the California Medical Association.

*A statement by the chairman of the Council of the California Medical Association, before the Senate Fact Finding Committee on Public Health and Safety, at San Francisco, September 22, 1964.

It occurs to me that, through the hearings of the committee, you seek to inquire whether or not everything is being done to assure the public that the physician who treats any patient is competent and ethical and that the treatment given will be up to the standard of care acceptable to the community and the profession at large.

At the present time, a great deal of voluntary screening, review, supervision, regulation and disciplinary action takes place in county and state medical societies and in established hospital medical staffs. For instance, in addition to the requirements of education and licensure, a thorough investigation is conducted by county medical societies concerning the moral and ethical character of applicants for membership. The public is invited to submit to county medical societies, complaints concerning physicians' conduct, overcharges and other matters pertaining to the profession's integrity. These complaints are carefully investigated and erring members are appropriately admonished and disciplined. In order to be admitted to the medical staff of a modern hospital, a physician needs to prove his ability to render the type of care for which he has been trained and in which he has experience.

Through an audit procedure and a critical analysis of individual case records, various committees of a hospital medical staff review the care that is rendered. Thus, the members of the staff as a whole enhance their professional education, and the standard of care rendered is constantly improved.

The weaknesses in the system of voluntary, self-imposed discipline result from three principal factors:

1. Lack of legal sanctions.
2. Lack of immunity for those who testify before medical society and hospital staff committee hearings.
3. Incomplete appeal mechanisms.

The State Board of Medical Examiners has two major functions:

First, it conducts examinations, and licenses eligible applicants for a Physician's and Surgeon's Certificate. This function is, in general, performed in an admirable fashion.

The second function of the Board relates to disciplinary action, which it does quite effectively, against individuals with the criminal violations set forth in the statutes. It is hampered by the lack of manpower and of statutory authority from doing a more effective job in areas of unprofessional conduct, incompetence and dangerous antisocial behavior. It is also felt that it should be given greater responsibility to assist in the rehabilitation of erring physicians to a useful place in society.

In 1963, the California Medical Association House of Delegates adopted resolutions recommending that the State Board of Medical Examiners, in addition to its present power, be given broader authority to discipline physicians who habitually engage in unethical and immoral conduct injurious to patients, those who become professionally incompetent and those with psychiatric disability which interferes with proper treatment and care and thereby endangers patients. Again at the 1964 meeting of the House of Delegates, two additional resolutions were introduced urging the California Medical Association to study, in cooperation with the State Board of Medical Examiners, ways in which to improve the procedures, functions and duties of the board. An ad hoc committee was appointed to make the necessary studies and report recommendations to this committee of the Senate. I have had the honor of being appointed chairman of that ad hoc committee.

The authority to discipline carries with it the responsibility to rehabilitate. In all the discussions we have held, the thought has been expressed and emphasized that the present authority of the Board to supervise or foster the process of correcting and improving the conduct of an erring licentiate ought to be specifically expanded.

Section 2372 of the Business and Professions Code is entitled "Disciplinary Action." It gives the Board power to "discipline the holder of any certificate." In many cases, it is necessary and appropriate to suspend the right to practice or to revoke a certificate, but in others this penalty is too severe. What conditions of probation can be imposed by the Board are not made clear in the statute.

The concept of retraining and rehabilitation has gained more widespread acceptance since the original passage of the act. We can do, or attempt to do, things in the area of social and professional rehabilitation today that were not previously attempted. This broad power of rehabilitation may be inherent in the present statute, but is not clearly stated and we propose that the supervisory powers of the Board be specifically extended.

In Section 2376.5, the Board is given specific powers to determine terms and conditions to be imposed upon a licentiate when a petition for restoration of a license is granted. This authority should also be available in cases where the Board does not find it necessary to go so far as to revoke or suspend a license.

The probationary authority to discipline and rehabilitate ought to include, but not be limited to, the power to:

(a) Require a man to obtain additional medical training and pass an oral and/or written, practical, or clinical examination upon completion of the training;

(b) Require a man to submit to a diagnostic examination by one or more physicians appointed by the board;

(c) Restrict or limit the extent, scope or type of practice in an appropriate case and enforce such restrictions in all hospitals, whether public or private, as well as in office practice;

(d) Appoint, in appropriate cases, one or more consultants or proctors to whom a man shall report for supervision and guidance. These consultants should be considered officers of the Board when performing such duties, they should be personally

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immune from suit, and their services should be rendered to the probationer without charge.

Hospital Staffs

Under the present law, hospitals are subject to the provisions of the Hospital Licensing Act administered by the State Department of Public Health. The provisions of that law are aimed at insuring that the institution is a safe and secure place for infirm persons to obtain bed, board, nursing and related services.

On the other hand, hospital medical staff bylaws and other regulations and laws have properly assumed that in most cases, the physicians who prescribe and treat patients in a hospital are self-disciplining with regard to competence in their respective fields and worthy in character and professional ethics. The housing function and medical staff activities are separate and distinct. The first is a matter of protection of the public health and safety comparable to the regulations applicable to many other types of institutions. The second is a matter of competence and behavior, individually and collectively, of the members of a licensed, responsible profession.

The licensure of a hospital as a place of safe accommodation should not be dependent upon the degree of self-discipline of the medical staff, nor should the recognition that the medical staff adequately supervises and regulates its own behavior be dependent upon the safe accommodation provision of the former. Since these two functions relate to totally different spheres of concern for the public good, they should be considered, if the need arises, by those governmental agencies whose responsibilities most nearly correspond to the function in question.

If governmental involvement is necessary, the Board of Medical Examiners is clearly the body to evaluate the adequacy of professional self-discipline in medical staffs. It could readily perform such evaluation by regulation and with a reasonable amount of cooperation from medical and hospital organizations and the Bureau of Hospitals, without in any way interfering with the authority of the latter to inspect, license and regulate the hospital itself as a place of public accommodation. If such authority were given to the Board, we would recommend that it be declared unprofessional conduct for any licentiate to regularly treat or prescribe for patients in any hospital the medical staff of which does not provide for regular, periodic evaluation of the standards of care rendered to the patients therein. Hospitals should have established procedures and regulations necessary to carry out and enforce these concepts. The California Hospital Association joins us in this recommendation and offers its assistance in implementation.

New Areas in Which the Board Could Take Action

The resolutions of the California Medical Association House of Delegates referred to earlier, and the provision of Senate Bill 1514—the bill referred to this committee for interim study—recommend additional grounds upon which the Board can take action against any holder of a certificate. We suggest that it would be appropriate to consider amending sections 2361, 2385, and 2411 of the Business and Professions Code.

Section 2361 provides that the Board ". . . shall take action against any holder of a certificate, who is guilty of unprofessional conduct . . . or whose certificate has been procured by fraud . . ." This section might be amended to state that unprofessional conduct shall include, but not be limited to:

(a) Violation or an attempt to violate any provision of the act or orders and regulations legally established by the Board;

(b) Repeated acts or course of conduct amounting to gross negligence, gross immorality or gross incompetence;

(c) The commission of any act involving moral turpitude, dishonesty or corruption, whether the act is committed in the course of his professional practice as a licensee or otherwise, and whether the act is a felony or misdemeanor;

(d) Conduct which would have warranted denial of a license.

Some of the terms suggested are broad. However, similar language is found in many of the licensing acts applicable to various professional and technical groups. I believe we can reasonably assume that the Board and the Attorney General's office will not proceed against a person under such a statute in doubtful cases. The suggested new supervisory mechanisms would furnish other safeguards to insure protection of the rights of an individual as well as of the public.

It has been suggested that by deleting from Section 2411 the three words, "required by law," the section would be broad enough to permit the Board to take action against a licensee who presented false claims to insurance companies, government agencies and others. This section would then read:

> "Knowingly making or signing any certificate or other document . . . which falsely represents the existence or nonexistence of a state of facts, constitutes unprofessional conduct within the meaning of this chapter."

Section 2385 is entitled "Mental Illness." It now provides that:

"The adjudication of insanity or mental illness, or the voluntary commitment or admission to a *state* hospital of any licentiate for a mental illness shall operate as a suspension of the right to practice of any certificate holder . . ."

It is recommended that this section be amended in two ways: First, the admission of a licensee to any hospital, other than a state hospital, for a mental illness, ought to be cause for an investigation to be conducted by the Board to determine whether any action would be appropriate regarding the right of such certificate holder to practice medicine without limitations.

Second, the Board ought to be given authority to consider and investigate complaints concerning the mental fitness of a licentiate to practice medicine without limitations, in cases in which commitment to a mental hospital is neither necessary nor appropriate. In such cases, the Board might be authorized to act when investigation clearly discloses a pattern of behavior which endangers the public health or safety in the community. Restrictions or limitations other than suspension of a license should be imposed when warranted. In these cases, a hearing should be provided just as is done in all cases other than those involving commitment for mental illness.

The suggested amendments to Section 2361 and Section 2385 would, in some cases, give the Board an option to proceed against the person on the basis of unprofessional conduct or mental illness. In either case, the restrictions ordered by the Board might be essentially the same. One thinks of the element of willfulness in regard to unprofessional conduct. That idea need not be present in cases involving mental illness. It is felt that there are degrees of mental illness that do not warrant commitment, but do call for restrictions to be placed on the practice of medicine by a license holder.

In cases involving commitment or admission to a state hospital for mental illness, the Board is required to institute summary proceedings to suspend a license. It is suggested that the power to proceed summarily be given to the Board in those cases where, after investigation, there is found clear evidence of immediate and continuing threat to the public health and safety if a certain licentiate is permitted to exercise his license to practice medicine. The Board would issue a temporary order of suspension of license, and provide for a hearing to be held within 15 days. This hearing should be in the nature of a proceeding to determine why the order should not be made permanent.

There are not many cases in which it will be necessary for the Board to exercise such summary powers. The existence of this power, in some instances, could prevent occasional gross abuses which now occur.

District Review Committees

In Senate Bill 1514, it is proposed that a new disciplinary board be created. We recommend that the power to license, supervise and discipline the holders of a Physician's and Surgeon's Certificate be retained by the Board of Medical Examiners. In order for the Board to carry on the expanded activity recommended, it should be authorized to establish and create a district review committee in each of the five appellate districts designated for district courts of appeal in Government Code Section 69012. These district committees should be composed of five persons holding a valid Physician's and Surgeon's Certificate. They should be chosen from the district they represent and serve for a term of four years. They should be paid per diem and expenses similar to the provisions made for members of the Board of Medical Examiners. The manner of selecting the district review committee members could be made in any one of several ways. Senate Bill 1514 proposed that all licensed physicians elect the disciplinary board members therein provided for. The district review committees could be elected by physicians in the five districts, or they could be appointed by the Governor or the Board of Medical Examiners.

These committees should have authority to hear contested cases assigned to them by the Board. They need not be assigned only cases involving physicians residing in their district. All hearings conducted should be held in accordance with the provisions of the Administrative Procedures Act. After hearing a case, the committee should prepare a proposed decision in such form that it may be adopted by the Board of Medical Examiners as *the* decision in the case. The Board should be able to adopt the decision in its entirety or reduce or modify it as its discretion dictates.

Such a system will provide greater identification of local areas with problems concerning the standards of integrity and dignity within the profession.

Cost of the Program

Finally, we propose that the cost of this expanded program be borne by the profession, and recommend that Section 2458 be amended by raising the maximum permissible renewal fee from $20 to $40.

* * *

We have worked closely with the State Board of Medical Examiners in developing recommendations which will assist in maintaining California's leadership in promoting the best possible health care for its citizens, maintaining the integrity of the mem-

bers of the medical profession, and in promoting standards of practice second to none. We are most grateful for the opportunity to present these views to this committee and assure you of our desire to work closely with you in developing needed amendments.

I would be most happy to answer any questions you have.

Further Testimony*

Senator Stiern and Members of the
Fact Finding Committee:

The California Medical Association appreciates the opportunity of presenting further testimony supplementing that given at your first hearing September 22 in San Francisco.

At that time the State Board of Medical Examiners and the California Medical Association presented a number of suggestions and specific proposals which would give increased statutory latitude and increased manpower to the Board of Medical Examiners in order to achieve the intent of S.B. 1514.

The testimony presented by the Board and by the Association were in general agreement except on the wording of suggested amendments to Section 2385 of the Business and Professions Code relating to disciplinary procedures necessitated by mental illness. Your Committee is aware of the fact that this is a most complex problem and you must certainly appreciate the fact that writing a law on this subject requires most careful consideration, so that both the public and the profession may be wisely but effectively protected. Since September 22, we have made several more attempts to arrive at specific wording of proposed amendments to achieve this purpose. On October 9 a meeting was held by representatives of the California Medical Association, the State Board of Medical Examiners, the California Psychiatric Associations, and the Los Angeles County Medical Association, to further explore this problem. The consensus of this meeting was to the effect that there was general agreement as to areas in which the Board needs additional authority and also recognition of the importance of encouraging rehabilitation of the mentally ill physician under adequate safeguards. Specific language to properly achieve this has not yet been evolved.

I have been authorized to request your Committee to defer action on the mental illness section in order to permit the several organizations intimately concerned with this problem, a little more time to agree on the actual wording of a proposed amendment. We believe we are fairly close to this now and would jointly agree to have the actual wording submitted to you no later than December 1.

Several other areas in our testimony on September 22 were left uncompletely defined or have perhaps caused some misunderstanding. The subject of the method of selecting the membership of the proposed district subcommittees of the Board, has brought forth from our membership two alternative proposals to be submitted for your consideration:

Proposal A would provide that three members of the five man district subcommittee be elected by the licentiates in the district, with the remaining two positions to be filled by appointment.

The other proposal is offered in the event the Legislature would not accept the election of the subcommittee members by the profession. Proposal B would provide that the subcommittees be appointed by the Board of Medical Examiners.

The thought behind these proposals is that the profession would then have some, but not complete, choice of those who might sit in judgment upon them.

The final area in which it appears that our previous statement was not entirely clear, relates to the area of self-regulation of hospital medical staffs. We are strongly of the opinion that those hospitals which do have organized medical staffs, are doing, or with guidance already available from voluntary organizations, are capable of doing a just and commendable job of quality control and professional self-discipline. There could be no beneficial result from the involvement of any governmental agency in this area of professional discipline.

It is only in the area of those hospitals which do not have an organized medical staff or other review mechanisms that we believe some action is needed. Our recommendation is that the Board of Medical Examiners be given the authority to take action on the grounds of unprofessional conduct against any licentiate who regularly attends or treats patients in a hospital, which does not have an established mechanism for periodic review and evaluation of the medical care rendered therein. Both the California Medical Association and the California Hospital Association offer their assistance to the Board in implementing this recommendation, if it is adopted.

The California Medical Association again extends its thanks to the Fact Finding Committee for the opportunity of making these presentations and wishes to assure the Committee of its continuing desire to be of assistance in developing effective, just and workable legislation for the benefit of the public.

*Statement by Dr. Anderson before the Senate Fact Finding Committee on Public Health and Safety, October 13, 1964, at Los Angeles.

Board of Medical Examiners

JUSTIN J. STEIN, M.D.*
Los Angeles

MR. CHAIRMAN and members of the Senate Fact Finding Committee on Public Health and Safety:

I am Justin J. Stein, M.D., a member of the faculty of the University of California, Los Angeles, School of Medicine. I have been a member of the California Board of Medical Examiners since 1952. The Board appreciates this opportunity to have its position concerning matters of discipline as it relates to physicians and surgeons presented to you. I have been requested to appear as the representative of the Board.

The subject for discussion is Senate Resolution 204, 1963 Regular Session of the California Legislature. This resolution specifically requests that a study be made of the feasibility of establishing a medical disciplinary board with the power to review complaints against members of the medical profession for unprofessional and unethical conduct, and having the power to restrict or revoke the license of such individuals.

Testimony has been requested as to (1) whether there is a need to change existing laws or to enact new laws governing medical conduct and discipline, and (2) specific recommendations for legislative action. There is a need for revision and expansion of existing laws. Specific recommendations for legislative action will be outlined.

Background Information

Many individuals are probably not aware of the very large number of persons who have been licensed and who are being licensed each year by the Board of Medical Examiners. Probably few are aware of the extent of the problems relating to unprofessional conduct and with the problems associated with the practice of medicine and surgery. I wish to present the following information:

As of May 25, 1964, the total number of physicians and surgeons holding valid California license certificates to practice was 45,168. Of that number, 29,334 were located within the state of California and 15,834 were living out-of-state. From 1953 to 1962 inclusive, an average of 2,198 licenses to practice medicine and surgery in California were issued each year by the Board of Medical Examiners. Since 1946, the California Board has issued more licenses to practice medicine and surgery than any other state. Approximately 2,400 licenses to practice medicine and surgery are given annually at the present time by this Board. There are only about 450 graduates from all the California medical schools each year. Many of the licentiates receive their medical education in other states and some come from foreign countries.

The total number of podiatrists who hold California licenses is 866 and of this number 718 are residing within the state and 148 out-of-state.

The number of drugless practitioners renewing their California license in 1964 was 66 and midwives five. No drugless practitioners or midwives have qualified for license since 1949 when certain changes were made in the Business and Professions (B & P) Code. No naturopaths renewed their certificates in 1964.

Also, 1,071 licensed physical therapists, 2,117 registered physical therapists, and 2,464 psychologists renewed their license certificates.

In addition to giving written and oral examinations to qualified individuals desiring licenses which come under the Board's jurisdiction, the Board approves medical schools, hospitals for internship within the state, and hospitals which treat patients with narcotic addiction. The Board also registers dispensing opticians.

One of the major functions of the Board is the right to discipline those licentiates who violate existing laws. The Board is further concerned with the rehabilitation of licentiates who have had action taken against their license.

How Big Is the Problem of Medical Discipline?

During the calendar year 1963, 78 accusations were filed against physicians and surgeons with 29 accusations pending as of December 31, 1962. During the calendar year 1963, 15 physician and surgeon licenses were revoked, 22 were revoked with

*A presentation before the Senate Fact Finding Committee at San Francisco, September 22, 1964. Not included here, but a part of Dr. Stein's presentation, were detailed suggestions for revisions of laws regulating the practice of medicine.

the revocation stayed and probation for a specified period of time. No certificates were suspended, five certificates were suspended with a stay of the suspension and probation for a specified period of time, seven physicians were given miscellaneous penalties, five complaints were dismissed, one case was placed off calendar, and there were 52 pending accusations as of December 31, 1963.

The greater number of accusations related to narcotic law violations, either self-use or failure to keep proper records. The next highest would be on a record of conviction either of a felony or a misdemeanor involving moral turpitude.

For the fiscal year July 1, 1963, to June 30, 1964, 353 complaints against physicians and surgeons were referred for investigation, with 117 complaints pending from the previous year, making a total of 470 matters for investigation during that particular fiscal year. Of the 470, 137 actions were taken either on the basis of a criminal action, a statement of issues in relation to an applicant, an accusation or investigation or petition for modification or termination of probation.

When one considers the large number of licensed physicians and surgeons under the Board's jurisdiction, the total number of complaints received by the Board represents only a fraction of 1 per cent. Physicians and surgeons often work 60 to 70 hours a week, see patients in all states of physical and mental health, and often under very trying conditions. It is highly gratifying that the medical profession of this state has such an enviable record and due cognizance should be taken of these facts.

The Board clearly recognizes that disciplinary problems do exist among medical licentiates. The members of the Board are most desirous that appropriate steps be taken as soon as possible to strengthen the Board's powers to discipline and to rehabilitate (if possible) such individuals.

Although a very good job is being done by the Board and the responsible members of the medical profession in California, we are all interested in not only raising the standards of medical practice but in also maintaining the highest type of professional conduct among the California medical licentiates.

The members of the Board do not take lightly their responsibilities and are keenly aware of the necessity for certain revisions in the Business and Professions Code relating to the practice of medicine in order that a better job can be done.

Present Board Authority

The matter of the present authority of the Board to discipline licentiates and the need for change or expanded authority in this area have been under consideration by the Board for some time. Meetings have been held with representatives of the medical profession and with members of the staff from the Attorney General's office, who, as you know, provide the legal counsel for the Board.

I believe it advisable to briefly review the existing provisions of the Business and Professions Code which authorize the Board of Medical Examiners to take disciplinary action against its licentiates with particular reference to those holding certificates to practice as physicians and surgeons.

There are 24 sections of the Code which specify what constitutes "unprofessional conduct" and authorize the Board to proceed with disciplinary action. These sections relate to the:

1. Procuring the certificate by fraud or misrepresentation.
2. Revocation of a certificate in another state.
3. The procuring or aiding or abetting or agreeing to procure a criminal abortion.
4. Violation of any of the provisions of Chapter 7 of Division 2 of the Health and Safety Code.
5. Wilful betraying of a professional secret.
6. Certain types of advertising.
7. The conviction of a felony or any misdemeanor involving moral turpitude.
8. Conviction or cash compromise of a violation of the Harrison Act regulating narcotics.
9. Conviction of any statute regulating narcotics.
10. The violation of any statutes of this state regulating narcotics or dangerous drugs.
11. Impersonation of another licensed practitioner or permitting another person to use his certificate.
12. The using or prescribing or administering to himself named narcotics.
13. The use of dangerous drugs or alcoholic beverages to the extent that it would be dangerous to himself, to others and to the public.
14. The employing or aiding or abetting an unlicensed person.
15. The use of any fictitious, false or assumed name.
16. Employment of "cappers" or "steerers."
17. Prescribing of dangerous drugs without a previous examination or medical indication of the need for the drug.
18. The offering, delivery or acceptance of unearned rebates, refunds, discounts, etc.
19. The use of the title "doctor" or the letters or prefix "Dr." without further indicating the type of certificate he holds constitutes unprofessional conduct.
20. Knowingly making or signing any certificate or other document required by law which falsely represents the existence or nonexistence of a state of facts, constitutes unprofessional conduct.

Every certificate issued by the Board may be suspended or revoked (Art. 13, Section 2360). The Board shall take action against any holder of a certificate, who is guilty of unprofessional conduct which has been brought to its attention, or whose certificate has been procured by fraud or misrepresentation or issued by mistake (Art. 13, Section 2361).

Disciplinary action may be taken against a licentiate of the Board whose default has been entered or who has been heard by the Board and found guilty, by any of the following methods:

(a) Suspending judgment.

(b) Placing him upon probation.

(c) Suspending his right to practice for a period not exceeding one year.

(d) Revoking his certificate.

(e) Taking such other action in relation to disciplining him as the Board in its discretion may deem proper (Art. 13, Section 2372, B & P Code).

At first glance, one might believe that revision or expansion of Board rules and regulation is not necessary. However, adequate evidence will be presented to justify the need.

Strengthening of Existing Laws

The present provisions of the B & P Code have established a good foundation upon which to build for the future. It is not considered necessary to establish a new legislative concept at this time. Certain guidelines have been formed that have been based upon (a) court decisions, (b) Attorney Generals' opinions, and (c) previous court cases and precedents.

It is the unanimous opinion of the members of the Board that a separate medical disciplinary board not be established, but that any proposed additions or revisions of the B & P Code concerning discipline and relating to the practice of medicine be retained by the Board of Medical Examiners. It would be very confusing and impractical to have one board for licensing and a separate one for disciplinary action.

Areas Where Revisions of the B & P Code Relating to the Practice of Medicine and Surgery Are Necessary

In the majority of instances where violation of the B & P Code relating to the practice of medicine and surgery has occurred, it is not difficult to render a decision. There are a number of "grey" areas, however, which do exist and about which the Board is greatly concerned. Examples are as follows:

(a) Repeated acts of gross negligence (proposed amendment to Section 2361, B & P Code).

(b) Gross incompetence. A medical licentiate should not be permitted to continue to practice who has not maintained reasonable professional competence (proposed amendment to Section 2361, B & P Code).

(c) Gross immorality (proposed amendment to Section 2361, B & P Code).

(d) Professional conduct (proposed amendment to Section 2119, B & P Code).

(e) Mental illness (proposed amendment to Section 2385, B & P Code).

(f) Strengthening present sections (proposed amendments to Sections 2390, 2411, 2360, 2372, 2379 of B & P Code and Section 1881 of the Code of Civil Procedure) and to Sections 11501 and 11523, Government Code.

(g) Suggested new article 2.1 to the B & P Code.

The establishment of a district review committee in each of the five appellate districts designated for district courts of appeal within the jurisdiction of the Board of Medical Examiners. Each district review committee to be composed of five individuals who hold valid licenses to practice medicine and surgery in this state. It is further recommended that such individuals be appointed by the Governor for a term of four years. (See suggested new article 2.1 to B & P Code.)

The district review committees would be assigned cases to hear by the Board. A hearing officer would assist this committee and also assure that all the rights of the accused would be protected. All decisions made by this committee would be adopted, rejected or modified as deemed necessary by the Board. Such committees would not replace the Board.

It is the opinion of the members of the Board that if such committees were appointed, the cases of individuals whose licenses were subject to disciplinary action could be more quickly processed. Also more effective rehabilitation of those who have violated the laws relating to the practice of medicine and surgery could be carried out. The mere fact that such district review committees existed and that prompt disciplinary action would be taken in the case of anyone who violated the laws, might serve as a deterrent to some licentiates.

Work Load of the Board

The work load for the Board is steadily increasing, largely because of the constant increase in the number of licentiates, and this trend will certainly continue with the tremendous growth of the population of California.

The members of the Board have already decided to increase the June, August and October meetings by an additional day. It is impossible to hear all

the cases that the Board would like to at the present time. Many cases are referred to a hearing officer who renders an opinion and then the Board reviews the decision and either adopts or does not adopt the hearing officer's decision.

The Board is now actually in session 29 days of each year. An additional 30 days is required to grade the examination papers, and in addition much business is transacted by mail and phone, by committee action and by special meetings. Eventually, full-time Board members may be necessary, but this is not considered necessary at this time.

The Cost

It has been recommended that the cost of this program be paid from increased renewal fees. The recommendations are that a renewal fee shall be fixed by the Board at a sum not in excess of 40 dollars nor less than four dollars.

Summary

1. The medical profession is to be congratulated upon the fact that a high standard of professional conduct has been maintained in this state.

2. The Board of Medical Examiners recognizes the need for revision and expansion of existing laws relating to the practice of medicine. Suggested revisions and expansion of existing laws has been presented for consideration.

3. If the changes in the existing laws are adopted, the Board will be able to do a much more efficient job, both in the disciplining and rehabilitation of its licentiates who violate the laws. Not only will the standards of medical practice be elevated, but greater safeguards for the public will be provided.

4. It is fully recognized that it is impossible to "spell out" every possible detail in making these recommendations. After experience has been gained, further changes may be necessary.

5. It has been recommended that increasing the license renewal fees of the licentiates will adequately pay for the additional costs of the proposed program.

6. The basic concept of the proposals made is to strengthen and expand the existing laws and maintain the program under the Board of Medical Examiners.

It has been a pleasure to have this opportunity to appear before you, and I wish to thank you on behalf of the members of the Board. We have the same objectives. We want to do the best possible job for the people of this state and for the medical profession. Your committee can expect the utmost cooperation from the Board.

Council Meeting Minutes

Tentative Draft: Minutes of the 504th Meeting of the Council, Los Angeles, International Hotel, September 19, 1964.

The meeting was called to order by Chairman Anderson in the Ballroom of the International Hotel, Los Angeles International Airport, on Saturday, September 19, 1964, at 9:30 a.m.

Roll Call

Present were President Doyle, President-Elect Teall, Speaker Quinn and Councilors MacLaggan, Wilson, Todd, Bullock, O'Connor, Ham, Rogers, Maguire, Richard S. Wilbur, Miller, Watts, Kay, Kaiser, Anderson, Grunigen, Shaw and Sherman.

Absent for cause, Vice-Speaker Telford, Secretary Hosmer, Editor Wilbur and Councilors Gooel, Murray, Dozier and Cosentino.

A quorum present and acting.

Present by invitation were Messrs. Hunton, Thomas, Clancy, Collins, Whelan, Klutch, Clark, Bowman, James, Eberlein, Goldman and Moreillon, Mmes. Griffith and Redfern and Doctor Miller of CMA staff, Mr. Howard Hassard, legal counsel; Messrs. Read, Salisbury and Brown of the Public Health League; county executives Scheuber of Alameda-Contra Costa, Geisert of Kern, Baker of Los Angeles, Blankfort of Marin, Colvin of Monterey, Bannister and Blough of Orange, Walters of Riverside, Dochterman of Sacramento, Donmyer of San Bernardino, Burris of San Diego, Neick of San Francisco, Monnich of San Joaquin, Wood of San Mateo, Brown and York of Sonoma, Whitehall of Stanislaus and Addington of Forty First; Mr. Clifton Linville of California Hospital Association; Messrs. Bentley, Purdy, Babb and Potloff and Doctors Reynolds and Hoagland of California Physicians' Service; Doctors Osman Hull, Monterey, Arthur Howard, Fresno, and Warren L. Bostick, Los Angeles; and Mr. John Pompelli of the American Medical Association.

1. *Minutes for Approval*

Minutes of the 503rd Council meeting, held August 8, 1964, were presented and amended to delete the three words "already in effect" and the final words ("in California") and adding the word "other" before the word "blood" in the next to the last line shown under the "ACTION" paragraph of item 16. As amended, the minutes were approved.

2. *Membership*

(a) A report of membership as of September 16, 1964, was presented and ordered filed.

(b) On motion duly made and seconded in each instance, three applicants were voted Associate Membership. These were: Herschel H. Solomon, Alameda-Contra Costa County; Louis Kovitz, Santa Clara County; Bernard Frederick Hansen, Stanislaus County.

(c) On motion duly made and seconded in each instance, three members were voted election to Retired Membership. These were: George L. Athey, Fresno County; Arthur Floyd Gardner, Los Angeles County; George Long Barry, Santa Clara County.

(d) On motion duly made and seconded, reductions of dues were voted for 12 applicants.

3. *Audio-Digest Foundation*

Doctor Teall reported on his attendance at a meeting of the Board of Directors of Audio-Digest Foundation on August 27, 1964, at which time it was voted (1) that the annual meeting of the board would, by bylaw amendment, be changed to the time of the Council meeting in January, and (2) that surplus funds of the foundation would be contributed in equal shares to the American Medical Association and Research Foundation and the California Medical Education and Research Foundation, with the suggestion to CMERF that it apply the funds to medical schools in California that are not primarily tax supported.

ACTION: Voted to accept such funds with thanks and to authorize the Board of Directors of CMERF to use its best judgment in the distribution of funds so received.

4. *Report of the President*

President Doyle reported on various meetings he had attended in recent weeks, including component society meetings in Fresno and in Ventura and some districts of Los Angeles County. He also gave detailed reports on three meetings he had attended in Chicago, including (1) a meeting of state association officers held by the AMA, (2) the conference of medical executives and (3) the AMA Public Relations Conference.

5. *Report of President-Elect*

President-Elect Teall reported on his attendance at component society meetings in Sonoma and Mendocino-Lake Counties and a meeting of the Federation of State Licensing Boards attended by medical school deans, at which the principal areas of discussion were on the graduate training of foreign medical graduates and the enlarging of medical school faculties.

Doctor Teall also presented the report of the Certification Review Committee, showing 253 specialty certificates of former osteopathic physicians and surgeons acted upon to date and 22 others on which no action had been taken for various reasons.

Doctor Teall, in behalf of the Committee on Committees, also reported on several appointments to be made and requested nominations from Councilors.

6. *California College of Medicine*

Doctor Warren L. Bostick, dean of the California College of Medicine, reported on the receipt of 11 full-year scholarships for CCM and other Los Angeles area medical school students contributed by the LACMA Research Foundation of the Los Angeles County Medical Association, gave a progress report on the activities of the college and reported the death of one member of the board of trustees who was one of three trustees who had instituted a lawsuit against the conversion of the college to a medical school.

7. *State Department of Public Health*

Dr. Malcolm Merrill, state director of public health, reported on the decision of the Hospital Advisory Board to amend hospital regulations to permit fathers to be present in delivery rooms of hospitals where the attending physicians, the hospital staff and hospital administration agree. This decision will be voted upon by the State Board of Public Health in October.

Doctor Merrill further reported on the incidence of meningococcic meningitis at Fort Ord and on the cooperation between health officers and military personnel in a campaign to control the cyclical outbreak. He further reported on the prospective changes in health regulations on motor vehicle emissions, the proposed federal "War on Poverty" and the rise of venereal disease in persons under 20 years of age to the top position among communicable diseases in California.

8. *State Department of Social Welfare*

Mrs. Eunice Evans, deputy director of the State Department of Social Welfare, reported that the department is awaiting passage of the Social Security Act amendments now before the Congress, which include a provision which will permit the payment of MAA benefits in the same month in which OASI benefits are paid.

Mrs. Evans also reported on the department's studies on the furnishing of additional prenatal care as a deterrent to mental retardation and answered several questions put by Councilors.

9. *California Hospital Association*

Mr. Clifton Linville, president of the California Hospital Association, issued thanks to President

Doyle for publication on his page in CALIFORNIA MEDICINE of the liaison existing between the two organizations.

Doctor MacLaggan moved that the CMA set up with CHA a joint liaison committee to secure reports from the several voluntary regional hospital planning boards in the state.

ACTION: Voted to establish such joint committee and to name CMA representatives as members.

10. *California Physicians' Service*

Dr. T. Eric Reynolds, president of CPS, reported that the new contracts signed by Chrysler and Ford with the United Auto Workers included provision for outpatient psychiatric care to be delivered on a descending fee scale based on the number of visits and with a maximum fee payment of $400. He also reported that contract negotiations with the Texas Co. are based on the payment of the usual and customary fees of physicians in the various areas served.

Dr. Reynolds announced an AMA congress on insurance and prepayment plans to be held in Las Vegas, October 2 and 3, and urged attendance.

Doctor Paul Hoagland, CPS board chairman, reported that a health care plan for retired CPS employees had been approved by the board. A similar plan for CMA employees is being developed.

Dr. Hoagland also reported on the need of a substandard fee schedule for patients with sharply limited means and suggested that the Council plan to introduce a resolution calling for such a fee schedule in the 1965 House of Delegates. It was suggested that CPS prepare a proposed resolution to be submitted to the Council.

11. *Medical Executives Conference*

H. Martin Baker reported on the meeting of the Medical Executives Conference on September 18, at which discussion was held on membership dues billing, postal regulations on mailing permits and the proposed AMA publicity campaign in support of Kerr-Mills legislation.

12. *Scientific Board*

Councilor Shaw, chairman of the Scientific Board, reported on a statewide conference on continuing medical education now being planned and asked for suggestions. He also reported that the board had the 1965 Annual Session program well underway, that the support of medical libraries was under study and that a committee would report later on the desirability and need for state-operated respiratory disease centers.

13. *Component Societies Officers' Conference*

Councilor Sherman presented the report of the ad hoc Committee on Component Societies Officers' Conference, with recommendations that (1) the conference be held each year at least 45 days prior to the Annual Session; (2) a review and critique procedure be instituted; (3) audience participation should be provided; (4) both short and long-term objectives should be followed; (5) costs should be limited; and (6) the 1965 conference be planned close to the Los Angeles International Airport in conjunction with a scheduled Council meeting.

ACTION: Report accepted and approved.

14. *Committee on Committees*

Doctor Teall, chairman of the Committee on Committees, presented several nominees for approval, including

1. Doctor Harold Griffeath, San Francisco, to attend Conference on Cardiovascular Disease in Washington, D.C., November 22, at CMA expense, and to participate as member of state core committee to follow up on recommendations of conference.

2. Doctor Warren Moe, Los Angeles, to succeed Doctor Frank Bryant as a member of the Los Angeles County Committee on Hemolytic Diseases of the Newborn.

3. Doctors Charlotte Baer, San Francisco, and Peary Berger, Los Angeles, as additional members of the Advisory Committee to California Medical Assistants Association.

4. Committee on 1965 Component Officers' Conference, same membership as ad hoc committee, Doctor Edgar Wayburn, chairman.

ACTION: Above nominations approved for appointments.

15. *Bureau of Research and Planning*

Doctor Sherman reported that the report of the bureau on the supply of physicians in California would soon be forthcoming and urged that this report be published in CALIFORNIA MEDICINE.

16. *Committee on Legislation*

Doctor Sherman reported on his and Doctor MacLaggan's appearance before the Assembly Interim Committee on Social Welfare, at which both urged the extension of a prepayment basis for the medical care of eligible welfare recipients.

Doctor Sherman also reported on a request received for CMA support of Proposition No. 2 on the November ballot, a proposition calling for authorization of $380,000,000 of state bonds for educational purposes.

ACTION: Voted to publicize Proposition No. 2, which includes provision for medical educational purposes.

Mr. Ben Read reported that a number of interim committees will hold hearings on various proposals, including four meetings planned for Los Angeles on one day. He also reported that the committee would meet the following week with the chairmen of county legislative committees.

17. *Medical Staff Survey Committee*

Doctor MacLaggan presented a proposed or model section to be added to hospital staff bylaws, to provide that new applicants for staff privileges be elected initially as provisional members, this status to remain for three-month intervals renewable up to one year.

ACTION: Proposed hospital staff bylaw amendment approved.

Doctor MacLaggan also presented a second proposed or model hospital staff bylaw, to provide for a judicial review committee to hear appeals from staff applicants whose admission was denied or whose privileges were restricted or limited.

ACTION: Voted to recommend in model hospital staff bylaws a provision for establishment of appeal mechanism for applicants whose staff admission or readmission is denied or whose privileges are curtailed or not increased, and that members of such appeal body not include members of any staff committee who had previously dealt with staff privileges of the applicant.

18. *Commission on Public Agencies*

Doctor MacLaggan reported for the commission the proposal that a committee be authorized to work with the State Department of Public Health on a review of radiation control, including training and qualifications of inspectors.

ACTION: Approved authorization of such committee, Committee on Committees to select membership of the committee.

Doctor MacLaggan also proposed that the Crippled Children's Services of the State Department of Public Health be asked to re-evaluate the eligibility of physicians attending patients under the program.

ACTION: Approved request to State Department of Public Health for such re-evaluation.

19. *Ad Hoc Committee on Radiology*

The committee proposed that a study be made in Kern and Santa Clara Counties for a three-month period, studying all x-ray films made under four RVS numbers, with a review committee having equal representation of orthopedists, general practitioners, internists and radiologists. Cost of the study estimated at $3,500 to $4,500, to be shared equally by CMA and California Radiological Society. The latter has not yet voted to meet its share of this cost.

ACTION: Proposal tabled at this time.

20. *Judicial Commission*

The commission reported on the question referred to it relative to the payment by CPS and other health insurance carriers of fees to physicians for services rendered to members of their own families. The report showed that such treatment, except in emergencies, is unethical, that health insurance is available for the protection of physicians' families and that other physicians should be called upon for such services and accept insurance benefits where available.

ACTION: Report of Judicial Commission approved.

21. *Ad Hoc Committee on Medical Discipline*

Doctor Anderson presented the committee's report and requested authority to place the report's recommendations before a Senate interim committee hearing. The report urged that the State Board of Medical Examiners be granted broader powers for disciplining and rehabilitating licentiates, including the formation of district committees to hear complaints and make recommendations for board action, expansion of probationary powers, broadening of areas of unprofessional conduct, authority for summary suspension of license and immediate hearing in serious cases and authority for the board to maintain its own staff of qualified investigators.

ACTION: Committee report approved and Doctor Anderson authorized to present report recommendations to Senate interim committee.

22. *Commission on Community Health Services*

Doctor Harold Kay, chairman, reported on his testimony before the Commissioner of Insurance in opposition to granting a permit for the sale of blood insurance in California, decision on which is expected early in 1965. Doctor Kay also reported that Community Health Week would be October 18-24, simultaneous with AMA plans for promoting greater use of the Kerr-Mills Act.

The commission recommended that Section 650 and related sections of the Business and Professions Code, together with the commission's statement on clinical laboratories, as approved by the Council and the House of Delegates be communicated to all CMA members.

ACTION: Above recommendation approved.

Relative to Assembly Bill 2658 in the 1963 Legislature, relating to the solicitation of business by out-of-state clinical laboratories, the commission recommended that no legislation of this type be sup-

ported but that if such legislation were seriously considered the CMA should propose as an alternative a prohibition against the solicitation of pathological specimens originating in the human body by any clinical laboratory.

ACTION: Voted to oppose all legislation relating to clinical laboratories at this time.

23. *Bureau on Communications*

Doctor Warren L. Bostick, chairman, reported that the "Doctors At Work" television series was now being used in New York and elsewhere, for some return on the investment. He also reported that the bureau was developing a communications effort directed at hospital administrators, chiefs of staff and department heads.

Doctor Bostick also reported that the bureau had considered the position of subscription television and its capacity to embrace medical subjects and wished to propose to the AMA that its advisory committee to radio, television and motion pictures be placed at the disposal of subscription television producers.

ACTION: This proposal approved for application in the event subscription television remains as a communications medium following the November election.

On the proposed AMA advertising campaign, the bureau recommended that the CMA agree to cooperate with the idea of the program but that the advertising copy be modified by competent staff members and be used only in those areas approving the final copy. The Committee for Emergency Action would supervise all approved copy.

ACTION: Voted to follow recommended procedure.

Doctor Bostick referred to resolutions 16-64, 65-64 and 94-64 of the House of Delegates relating to the provision of medical care, and suggested these be referred to the Commission on Community Health Services. Doctor Teall discussed the need for assembling information on all available medical care resources as a means of backing up the guarantee of medical care regardless of ability to pay.

ACTION: Voted approval of the concept of assembling health care resources and referred to Commission on Community Health Services.

24. *Committee on Health and Accident Insurance*

The chairman read a letter from a member relative to a specific insurance coverage for sickness and accident disability coverage, which was referred to the Committee on Health and Accident Insurance.

Adjournment

There being no further business to come before it, the committee was adjourned at 5:05 p.m.

CARL E. ANDERSON, M.D., *Chairman*
MATTHEW N. HOSMER, M.D., *Secretary*



In Memoriam

COHEN, ABRAHAM D., Fresno. Died September 18, 1964, in Fresno, aged 50. Graduate of Eclectic Medical College, Cincinnati, Ohio, 1939. Licensed in California in 1954. Doctor Cohen was an associate member of the Fresno County Medical Society.

✣

COLE, ROBERT, Los Angeles. Died September 5, 1964, in Los Angeles, aged 30, of carcinoma of pancreas. Graduate of the University of California School of Medicine, Los Angeles, 1962. Licensed in California in 1963. Doctor Cole was an affiliate member of the Los Angeles County Medical Association.

✣

DIAMOND, LEO L., Los Angeles, Died September 25, 1964, in Los Angeles, aged 49, of acute myocardial infarction. Graduate of the University of Nebraska College of Medicine, Omaha, 1938. Licensed in California in 1948. Doctor Diamond was a member of the Los Angeles County Medical Association.

✣

GILLIS, JOHN D., Los Angeles. Died September 8, 1964, in Los Angeles, aged 72, of arteriosclerosis. Graduate of Marquette University School of Medicine, Milwaukee, Wisconsin, 1917. Licensed in California in 1921. Doctor Gillis was a member of the Los Angeles County Medical Association.

✣

GLASS, RALPH M., El Cerrito. Died September 11, 1964, in El Cerrito, aged 56, of myocardial infarction. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1939. Licensed in California in 1939. Doctor Glass was a member of the Alameda-Contra Costa Medical Association.

✣

GREENWAY, H. HENRY, Malibu. Died September 22, 1964, in Los Angeles, aged 66, of coronary disease. Graduate of Oakland College of Medicine and Surgery, 1920. Licensed in California in 1921. Doctor Greenway was a member of the Los Angeles County Medical Association.

✣

HARVEY, JAMES ERNEST, Pasadena. Died October 4, 1964, in Pasadena, aged 74, of arteriosclerotic cardiovascular disease. Graduate of the University of California School of Medicine, Berkeley-San Francisco, 1917. Licensed in California in 1917. Doctor Harvey was a member of the Los Angeles County Medical Association.

✣

HECK, WALTER EMIL, San Francisco. Died September 19, 1964, in San Francisco, aged 48, of an aneurysm. Graduate of Syracuse University College of Medicine, New York, 1941. Licensed in California in 1948. Doctor Heck was a member of the San Francisco Medical Society.

✣

JACOBS, S. NICHOLAS, San Francisco. Died September 25, 1964, aged 82. Graduate of the University of California School of Medicine, Berkeley-San Francisco, 1908. Licensed in California in 1908. Doctor Jacobs was a retired member of the San Francisco Medical Society and the California Medical Association, and an associate member of the American Medical Association.

✣

JOHNSON, JAMES BUFORD, Beverly Hills. Died September 27, 1964, in Beverly Hills, aged 54, of heart disease. Graduate of the University of Tennessee College of Medicine, Memphis, 1933. Licensed in California in 1935. Doctor Johnson was a member of the Los Angeles County Medical Association.

✣

PHILLIPS, ALFRED BOB, San Francisco. Died September 22, 1964, in San Francisco, aged 38. Graduate of Stanford University School of Medicine, Palo Alto-San Francisco, 1951. Licensed in California in 1951. Doctor Phillips was an associate member of the San Francisco Medical Society.

✣

PHILLIPS, ALFRED LILES, Bonny Doon, near Santa Cruz. Died September 15, 1964, at Bonny Doon, aged 73. Graduate of Stanford University School of Medicine, Palo Alto-San Francisco, 1916. Licensed in California in 1916. Doctor Phillips was a retired member of the Santa Cruz County Medical Society and the California Medical Association, and an associate member of the American Medical Association.

✣

PINNEY, IONE, Los Altos. Died September 24, 1964, in Palo Alto, aged 77. Graduate of Bennett Medical College, Chicago, Illinois, 1910. Licensed in California in 1928. Doctor Pinney was a retired member of the San Joaquin County Medical Society and the California Medical Association, and an associate member of the American Medical Association.

✣

SHEETZ, MARTIN A., Chula Vista. Died September 29, 1964, in San Diego, aged 54. Graduate of the College of Osteopathic Physicians and Surgeons, Los Angeles, 1949. Licensed in California in 1949. M.D. degree from California College of Medicine, 1962. Doctor Sheetz was a member of the Forty First Medical Society.

✣

SMITH, HARRY JAMES, Oakland, Died October 3, 1964, in Oakland, aged 79. Graduate of Stanford University School of Medicine, Palo Alto-San Francisco, 1915. Licensed in California in 1915. Doctor Smith was a retired member of the Alameda-Contra Costa Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✣

TAVRIS, HYMAN, Los Angeles. Died September 27, 1964, in Los Angeles, aged 55, of acute coronary occlusion. Graduate of the University of Illinois College of Medicine, Chicago, 1938. Licensed in California in 1942. Doctor Tavris was a member of the Los Angeles County Medical Association.

The Committee on Scientific Assemblies of the

SCIENTIFIC BOARD

presents the

1965

ANNUAL SCIENTIFIC ASSEMBLY

San Francisco, March 28-31, 1965

Featured subject:

VIROLOGY

The current status of virus research
Applied virology
Treatment of virus diseases

For Hotel Reservations, See Page 400

PUBLIC HEALTH REPORT

MALCOLM H. MERRILL, M.D., M.P.H.
Director, State Department of Public Health

With California's poliomyelitis season drawing to a close—and with only two paralytic cases having been reported—it seems a good time to review the history of the disease in our state since the 1955 introduction of vaccine.

It has been almost ten years since the Salk vaccine (injectable poliomyelitis vaccine, or IPV) was introduced, and now more than two years since the mass community immunization campaigns were conducted using the oral poliomyelitis vaccine (OPV).

In most California counties the oral vaccine campaigns commenced in the fall of 1962 with Type I. Type II was given two months later and Type III in early 1963.

In the course of these community campaigns approximately ten million Californians received Type I vaccine, 9.7 million Type II and 7.7 million Type III. These vaccines now are given by private physicians and in public clinics as a routine immunization procedure.

The Salk vaccine was introduced in California in 1955 and paralytic cases have been on the decline since that time (see chart). However, even after five years of intensive promotion of Salk vaccine, paralytic cases continued to occur in the range of 75 cases to several hundred cases annually, predominantly in persons who had not received vaccine.

In the two poliomyelitis seasons since the introduction and mass use of oral vaccine there has been a further dramatic reduction in paralytic disease. Only 15 cases were recorded in 1963 and there have been only two cases thus far this year. If this control can be sustained, poliomyelitis can now be considered virtually eliminated. The oral vaccine, coupled with the herculean efforts of organized medicine in California, delivered the coup de grace to an already moribund enemy.

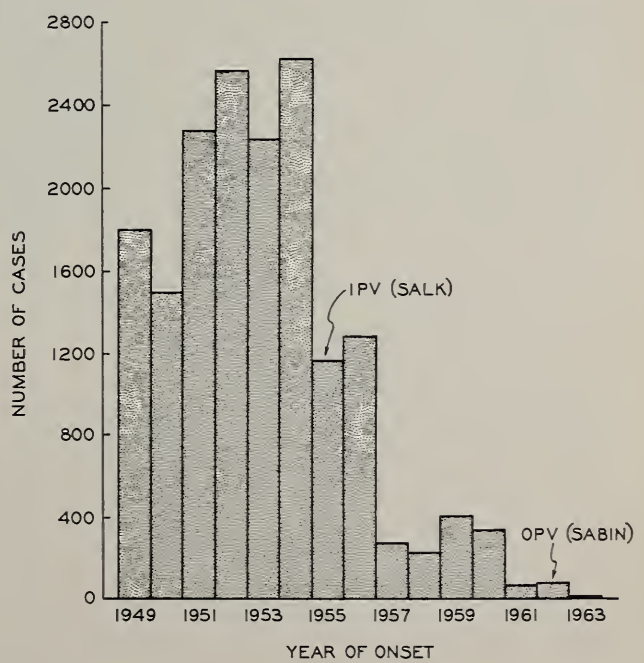
Careful surveillance has been maintained by the State Health Department in collaboration with the Public Health Services, Communicable Disease Centers to assess any risk which might attend the mass use of the oral vaccine.

Soon after the mass use of oral vaccine a few cases of paralytic poliomyelitis began to occur, particularly after Type I and III. These were scattered throughout the country, including some in California. The Surgeon General of the United States convened a special advisory committee in 1962 to examine this question. The committee at its meeting in December 1962 stated:

"It should be emphasized that the Committee does not consider that an individual case can be proved to be caused by the vaccine and no laboratory test has thus far provided a definite answer. However, it has attempted to decide for each case whether or not it is 'compatible' with the possibility of having been induced by the vaccine. Cases have been judged as 'compatible' when three criteria were met: (1) Onset within a period (4 to 30 days after feeding) consistent with a reasonable incubation period; (2) An illness clinically consistent with paralytic polio; and (3) Laboratory findings which do not exclude a vaccine relationship."

The advisory committee met again in June 1964 and further analyzed all cases of paralytic disease

NUMBER OF CASES OF PARALYTIC POLIOMYELITIS
CALIFORNIA, 1949-1963



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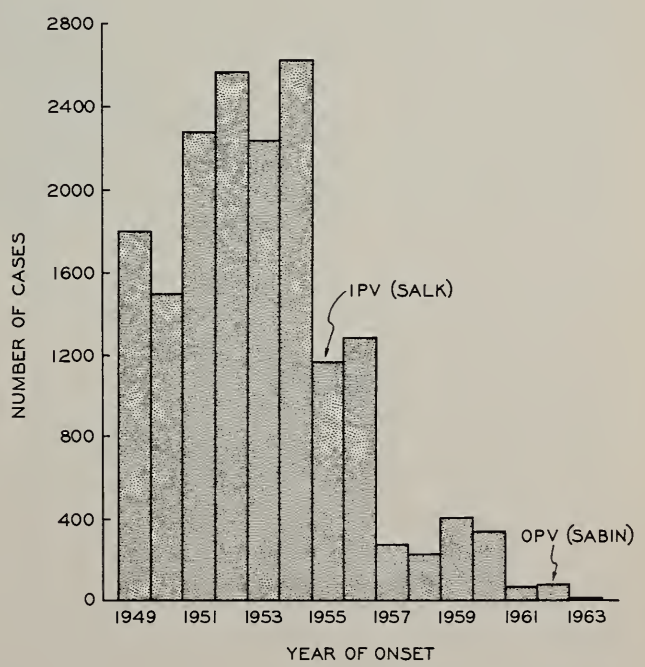
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NUMBER OF CASES OF PARALYTIC POLIOMYELITIS
CALIFORNIA, 1949-1963



which had come to the attention since the introduction of oral vaccine. The report of this committee with a detailed analysis has just been published. The definition of "compatible" was clarified further.

The committee again emphasized the great reduction in paralytic poliomyelitis achieved by the large scale use of Salk and Sabin vaccines during the last decade. The committee considered a total of 87 cases, of which 57 were termed "compatible." Fifteen cases followed Type I vaccine, two followed Type II and 36 followed Type III. These "compatible" cases occurred largely among adults and predominantly in males.

In evaluating the risk, the committee recognized that it is not possible to prove that any individual case was caused by the vaccines but, considering the epidemiologic evidence developed with respect to the total group of "compatible" cases, the committee believes that at least some of these cases were caused by the vaccine. According to the report the extent of the "risk factor" for Type III is only one case in 2.5 million doses administered; for Type I only one in 6 million; and for Type II only one in 50 million.

In California the poliomyelitis picture has been favorable. In 1962, a total of 76 cases of paralytic disease were considered California cases with onset of illness in that year. Following the mass immunization campaign with Type I in September, 1962, several cases of paralytic illness came to attention and were thoroughly investigated. Five cases were considered "compatible" within the meaning of the Surgeon General's definition.

In 1963, a total of 15 cases of paralytic poliomyelitis were considered California cases with onset in that year. Five of these again fell into the category of "compatible" cases within the meaning of the Surgeon General's definition.

So far in 1964 only two cases have been reported, in neither of which had the patient received oral vaccine.

The success of the vaccine program is unquestioned. Ten years ago, in 1954, there were over 2,600 cases of paralytic poliomyelitis in California. This year, to date, there are only two. In the intervening years the population has increased by about 50 per cent. The problem of vaccine association of cases has to be seen in this broad perspective. It has to be considered in relation to the overall results achieved, namely, the virtual elimination of poliomyelitis from the community.

Vaccination against poliomyelitis should be continued, with emphasis on infants and children, who form the main reservoir of the infection. In order to assure the elimination of the disease from the community it is imperative that all infants and children receive the vaccine. Otherwise new epidemics will occur in the future.



LETTERS *to the Editor*

Erythroblastosis Recommendations Misinterpreted

In the fall of 1963, there was a report of the Foetus and Newborn Committee of the Northern California Chapter of the American Academy of Pediatrics entitled, "Rh"—The "ABC" of Hemolytic Disease of the Newborn (HDN)—a Suggested Plan for Practical Diagnosis and Treatment." In the Spring of 1964 this "suggested plan" was printed and distributed by the Department of Public Health to all hospitals for the edification of practicing physicians, but was not meant to reflect the official opinion of the Department of Public Health.

On March 16, 1964, Mr. James E. Ludlam, the Legal Counsel for the California Hospital Association, circularized a letter in which he states, "if there is litigation involving the practice which has been recommended by this statement and not followed in this particular case, we can anticipate that the plaintiff's attorney will probably obtain the admission of this material as evidence of failure to follow *proper practice*."

The Committee which originated the "Suggested Plan" had no idea that their recommendations would, should, or could have any such legally binding, obligatory or mandatory implementation. There is absolutely no reason that these recommendations be accepted as "community *proper practice*" since the practice in a given community must vary considerably depending upon local laboratory and hospital facilities, availability of trained personnel, and many other such factors of purely local circumstances.

At present, there is a study committee sponsored jointly by the California Medical Association and the State Department of Public Health which, for the past three years, has been reviewing fatal cases of Hemolytic Disease of the Newborn. This committee plans to publish a statistical evaluation of all "avoidable factors" as revealed by the intensive and detailed study of these fatal cases. Recommendations for Minimum Standards for the Management of Hemolytic Disease of the Newborn will be made for any community where this disease might be anticipated. There will also be published an Idealized-theoretical Plan for Management, much of which will be in the fields of investigational or research medicine. This committee with its three regional subdivisions, and also, many experts in the field of hematology, already differs in many aspects from the "Suggested Plan" of the Foetus and Newborn Committee of the Northern California Chapter of the American Academy of Pediatrics.

It is the opinion of the undersigned that the "Suggested Plan" of the Northern California Chapter of the American Academy of Pediatrics be considered only as originally intended, i.e., to be a guide and a source of further information to the practicing physician and that the plan be modified according to local area practice, individual physician judgment, and the local availability of hospital and laboratory facilities.

Joseph H. Kushner, M.D., *San Francisco, Chairman, Region I**
Carol B. Hyman, M.D., *Los Angeles, Chairman, Region II**
Robert Chinnock, M.D., *Los Angeles, Chairman, Region III**

*Committee on Hemolytic Disease of the Newborn, Mortality Study, of the California Medical Association.

AMA-ERF

WOMAN POWER—8,655 members *strong*—endlessly contributing time, energy and effort to AMA-ERF during the 1963-1964 fiscal year, culminated in the National Award at the AMA Convention in San Francisco June 23, 1964. California topped the nation with the highest total contribution of $47,486.60, with special Certificates of Merit to the Forty-First Medical Society Auxiliary for its donation of $12,804, and to the Los Angeles County Auxiliary for $9,288.60, each in its respective county membership category. The Forty-First Auxiliary also received the Certificate of Achievement at the annual State Fall Conference, held in Coronado on September 30, 1964, not only for the largest contribution from any county in the state and the nation, but for a 653 per cent increase over last year, and $27.42 per capita for its 467 members. Second place awards were also presented to Los Angeles County for their contribution of $9,288.60, Butte-Glenn for a 340 per cent increase over last year, and Tulare County for $15.40 per member.

Many inquiries have been directed to me as to how we generate so much enthusiasm in our state for the AMA-ERF project. Frequently, I compare my duties, and the duties of the 35 county chairmen to those of salesmen, for we are selling a product. Is there a better investment in America today than the future of our young men and women who can pave the way to the private practice of medicine and research under a free enterprise and not governmental control? The greatest danger is that freedom can be nibbled away because each decision turned over to the government is one less decision which may be made by the individual. As Dr. Edward Annis has repeatedly pointed out, we in medicine are directly threatened by certain trends and proposals, but eventually all Americans will have to face up to the old question—for whom does the bell toll? By selling our product, we are communicating not only with the members of our profession but with the friends of medicine who are increasingly becoming aware that we must fight for our political, economic and professional freedoms not only in medicine but in industry, business and labor. The woman's auxiliaries to the AMA and CMA endeavor to explain and interpret to individuals and groups across the nation, the following current six projects of the AMA-ERF:

1. *Funds for Medical Schools.* Physicians contribute to medical schools through the Foundation in two ways. Some designate a specific school to receive their donations. Others donate to medical education in general. In the latter case, funds are distributed equally among the country's AMA-approved medical schools. Since 1952, physicians have contributed $14.1 million through the Foundation. Since 1955, the entire physician population has contributed an additional $31.6 million directly to the schools.

2. *Medical Education Loan Guarantee Program.* To assist young people in the financial aspects of their training, the AMA in 1962 launched its Medical Education Loan Guarantee Program. The program is designed as a source of financial assistance to medical students or MDs in internship or residency training who are in good academic standing and demonstrate a need for such assistance. Through 1963, 11,875 loans totalling $13.7 million had been made to 8,430 individuals—students in 85 medical schools and interns and residents in 583 hospitals.

3. *Research Grants.* This is a program of monetary assistance to qualified research workers for the purchase of supplies, chemicals, drugs, experimental animals, laboratory equipment and other items needed in their work. The program provides a quick source of funds for completion of smaller research projects, many of which are a prerequisite to large significant studies.

4. *Fellowship Program in Medical Journalism.* Financial grants are made to medical students and physicians interested in careers in medical writing and medical journalism. The Foundation program, through practical on-the-job training, helps to meet the critical need for highly trained writers and editors of medical periodicals, textbooks and monographs.

5. *Institute for Biomedical Research.* Beginning in 1965, the Institute will engage in a program of basic research centered on the discovery and under-

standing of molecular events with the living cell.

6. *Committee for Research on Tobacco and Health.* This committee has undertaken a scientific research study to determine how tobacco smoke affects health.

Funds for Medical Schools, and the Medical Education Loan Guarantee Program are the Auxiliary's main priority projects. Research Grants, Fellowship Program in Medical Journalism, Institute for Biomedical Research and the Committee for Research on Tobacco and Health are still in the infancy stage.

The annual reports from the county chairmen of AMA-ERF indicated that the following projects for raising money were considered the most successful: Chapeau Exchange, Cookbook Project, Cookie-Mix Project, Fashion Show and Luncheons, White Elephant Christmas Party, Sale of Beeswax Candles, Rummage Sale, Christmas Candy Sale, Magazine Agency, Baby Photo Sales in Hospitals, Thrift Shop, Dinner Dances, Barbeques, Bridge Marathon, Bowling, Art Exhibit, and the Christmas Card Project. The AMA-ERF notepaper and the playing cards continue to bring in a good revenue from all of the counties.

The combined forces of the Woman's Auxiliary to the American Medical Association contributed an all-time high of $307,318.14 to Medical Education and Research. In California our record of $47,486.60 speaks for itself. We are not just another social organization but partners in medicine as well as marriage. We are assisting in creating a better world by providing good medical leadership so we can preserve our freedom and our traditional way of life.

Doctor, help yourself by helping us on our fund-raising projects or contribute to the medical school of your choice through AMA-ERF.

Mrs. Warren Goux
AMA-ERF Chairman, W.A.C.M.A.

Physicians' Benevolence

Physicians' Benevolence Fund, Inc., continues to grow in providing needed aid for physicians or their families in pecuniary distress.

This fund has now operated for more than 24 years and has been able to help out in a number of cases of real need. At present more widows and their children are being aided than physicians.

The fund is not set up as a retirement program nor as an insurance plan. It is intended to serve as a temporary source of help to take up the slack when a family is in need and to help a physician's family to reestablish itself in a community. In addition, funds are budgeted each year to help maintain a retirement home as well as a facility at the home to provide for sanitarium care. This gracious and dignified home is sponsored by the Los Angeles County Physicians' Aid Association.

The operations committee for Physicians' Benevolence is made up of a group of dedicated California Medical Association members; the funds are administered by the Council, and all operating details are handled by the California Medical Association staff. The cost of operating this fund is a single item—a modest yearly audit fee.

The procedure for applying for aid under Physicians' Benevolence is quite simple. Any case of financial need discovered by any County Society is reported to Mr. John Hunton, Executive Secretary of the California Medical Association, and a brief questionnaire is then sent to the physician or Auxiliary member who is most familiar with the problem and can tactfully provide the facts in the case. The completed form and an authorization request are then forwarded to the operation committee. As soon as the authorization is approved, a check is mailed from the California Medical Association office. In case of emergency, funds can be made available before the investigation.

The goal of the Physicians' Benevolence Fund is to become self-supporting. Financing of the fund comes from the allocation of one dollar from the annual dues of each CMA member, together with contributions from the Woman's Auxiliary and from earnings on investments.

We of the Woman's Auxiliary pledge our continued support and willingness to participate in this most wonderful plan, and our thanks go to the members of the operating committee for their unselfish devotion to this charitable enterprise. This year we hope to have a 100 per cent "one dollar per Auxiliary member" sum as well as a sizable interest displayed in this unusually worthwhile and heart-warming program.

Mrs. Daniel W. Abels
Chairman,
Physicians' Benevolence

NEWS & NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

The West Coast Allergy Society has announced that it will hold courses for review and advanced learning in allergy along with the society's Annual Scientific Program December 2-4 at the Ambassador Hotel, Los Angeles.

* * *

The appointment of Dr. William W. Roe, Jr., as the **state Department of Employment's medical director** for Southern California with headquarters in Los Angeles, has been announced by Dr. Bert S. Thomas, head medical director at the agency's Sacramento headquarters.

Dr. Roe's appointment became effective October 1. He succeeded Dr. Daniel A. Treat, who transferred to Sacramento to join the staff of the State Department of Social Welfare as a special medical consultant in the Aid to the Disabled program.

SAN DIEGO

Dr. Robert N. Hamburger has been appointed assistant dean of the School of Medicine of the **University of California at San Diego** (U.C.S.D.). He will work with Dr. Joseph Stokes III, dean, in developing the new institution, Chancellor Herbert York said in announcing the appointment. The U.C.S.D. School of Medicine is scheduled to open in the fall of 1967 with an enrollment of 32.

SANTA CLARA

A new, large-scale **study of the pharmacology of anesthetics** and related drugs will be launched at Stanford Medical Center, with a grant from the U.S. Public Health Service.

The research will be directed by the Department of Anesthesia of Stanford University School of Medicine. The grant, announced by Dr. Luther L. Terry, surgeon general of the Public Health Service, will provide $191,505 for the first year's activities of a proposed seven-year program.

Dr. John P. Bunker, professor of anesthesia, will be the project director, and Dr. J. Weldon Bellville, associate professor of anesthesia, will be associate project director.

GENERAL

The Physician Fee Index in California increased by 0.6 per cent during the three-month period ending in June, 1964—the smallest rise in the index since the quarter ending in September, 1962, according to figures recently released by the California Medical Association's Bureau of Research and Planning.

The Index has risen 7.4 per cent in the two-year period since statistics were first collected in June, 1962. Increases had averaged about 1 per cent per quarter since September, 1962, the Bureau said.

The California Index measures changes in prices for 28 individual medical, surgical, radiological and laboratory procedures and is based on data collected from physicians in private practice throughout the state.

* * *

CALIFORNIA MEDICINE was named the **outstanding state medical journal** of 1964 last month by the American Medical Writers' Association. The citation said:

"This journal presents meritorious scientific material that is original, timely and of interest to all readers. The writing is literate and lucid. The ratio of scientific communications to other material is commendably high. Presented in a clean, uncluttered format, CALIFORNIA MEDICINE is a pleasure to the eye as well as a stimulus to the mind. Its strength lies in the fact that it patently reflects the progressive attitude of the medical profession of a great forward moving state."

Robert F. Edwards, Assistant to the Editor, attended the annual meeting of the Writers' Association in Philadelphia to accept the award for the official Journal of the California Medical Association.

* * *

Dr. Malcolm H. Merrill, director of the California Department of Public Health, has been awarded the **Bronfman Prize for Public Health Achievement** by the American Public Health Association. He is cited for his outstanding leadership in various fields, including control of California's air, water, food and recreational facilities, immunization, rehabilitation and fluoridation of drinking water supplies.

This award is the third in the past three years to be presented to California physicians, awards having been made to Dr. Charles E. Smith, dean of the U.C. School of Public Health, and Dr. Harold Chope, director of public health and welfare of San Mateo County in 1962 and 1963. The award consists of a scroll, a symbolical crystal cube and a $5,000 cash honorarium.

Because unconventional treatment of cancer is considered to be more widespread in California than elsewhere, the California Medical Association now is making available to physicians an up-to-date reference booklet titled "Unproved Cancer Treatment Methods."

The booklet, compiled by the CMA's Committee on Cancer, first was published in 1956 as a special service for physicians and revised recently. For a free copy, write to the Committee on Cancer, 693 Sutter Street, San Francisco.

Examined and evaluated are such widely-publicized treatments as Krebiozen, the Hoxsey Method, Laetrile and others. Some were investigated by the CMA's Commission on Cancer, some by the Bureau of Investigation, American Medical Association, and others by the Cancer Advisory Council, California State Department of Health.

Any physician knowing of the use of any unorthodox drug or method of treatment of cancer is urged to report it to the Coordinator of the Committee on Cancer or the Cancer Evaluation Unit at the California State Department of Health, Berkeley.

EDUCATION NOTICES

Meetings and Courses

COMMITTEE ON CONTINUING MEDICAL EDUCATION

THIS BULLETIN of the dates of continuing education programs and the meetings of various medical organizations in California is supplied by the Committee on Continuing Medical Education of the California Medical Association. In order that they may be listed here, please send communications relating to your future meetings or postgraduate courses to Committee on Continuing Medical Education, California Medical Association, 693 Sutter Street, San Francisco, California 94102.

Medical Meetings

DECEMBER MEETINGS

December 1-4—**Annual Presentation of the Postgraduate Course in Cardiology: "The Heart in the Electronic Age."** Scripps Clinic and Research Foundation, La Jolla. Tuesday-Friday. Contact: Harold M. Lowe, M.D., Scripps Clinic and Research Foundation, 476 Prospect Street, La Jolla.

December 2-4 — **West Coast Allergy Society Annual Meeting.** Ambassador Hotel, Los Angeles. Wednesday-Friday. Contact: Jack M. Chesebro, executive secretary, 1818 S.E. Division, Portland 2.

December 9—**Symposium Seminars on Respiratory Disease.** Sponsored by the Tuberculosis and Health Association of Alameda County. Jack London Inn, Jack London Square, Oakland. Wednesday. Contact: E. Ronald Riggall, M.D., program chairman, 121 East 11th Street, Oakland 6.

JANUARY MEETINGS

January 16—**Annual Symposium on Heart Disease.** Orange County Medical Association Building, 300 South Flower, Orange. Saturday. Contact: Howard G. Buswell, executive director, Orange County Heart Association, P.O. Box 1704, Santa Ana 92703.

January 20—**Annual Midwinter Symposium on Heart Disease.** Statler Hilton Hotel, Los Angeles. Wednesday. Contact: Mr. Chauncey Alexander, executive director, Los Angeles County Heart Association, 2405 West 8th Street, Los Angeles 90057.

January 22-24—**Annual Meeting of the Southern California Chapter, American College of Surgeons.** Palm Springs. Sunday-Tuesday. Contact: Russell Smith, M.D., chairman, 1930 Wilshire Blvd., Los Angeles.

January 27-30 — **The American Group Psychotherapy Association.** San Francisco. Wednesday-Saturday. Contact: Donald A. Shaskan, M.D., president, 49 Fourth Street, San Francisco.

January 29-31—**Clinical Conference in Pediatric Anesthesiology.** Childrens Hospital of Los Angeles. Friday-Sunday. Contact: M. Digby Leigh, M.D., Childrens Hospital of Los Angeles, 4614 Sunset Boulevard, Los Angeles 90027.

January 30-31—**Annual Midwinter Radiological Conference.** Biltmore Hotel, Los Angeles. Saturday-Sunday. Contact: John L. Gwinn, M.D., Children's Hospital, 4614 Sunset Boulevard, Los Angeles 90027.

FEBRUARY MEETINGS

February 13-14 — **Pediatric Surgery Symposium.** Presented by Childrens Hospital of Los Angeles. Saturday-Sunday. Contact: Newlin Hastings, M.D., program chairman, 4614 Sunset Blvd., Los Angeles 90027.

February 20-21—**Pediatric Urologic Seminar.** Childrens Hospital, Los Angeles. Saturday-Sunday. Contact: H. H. Edelbrock, M.D., 6753 Hollywood Blvd., Los Angeles 90028.

MARCH MEETINGS

March 17-18—**Cancer Seminar.** Sponsored by the Arizona Division of the American Cancer Society. Pioneer Hotel, Tucson. Wednesday-Thursday. Contact: Darwin W. Neubauer, M.D., 720 North Country Club Road, Tucson 85716.

March 24-25—**Annual Cardiovascular Symposium for the Physician Practicing General Medicine.** Statler Hilton Hotel, Los Angeles. Wednesday-Thursday. Contact: Marvin J. Rosenburg, M.D., chairman, 4314 W. Slauson, Los Angeles 90043.

March 28-31—**CALIFORNIA MEDICAL ASSOCIATION 94th Annual Session.** Scientific theme: "Urology." Fairmont Hotel, Mark Hopkins Hotel, San Francisco. Sunday-Wednesday. Contact: Mr. John Hunton, executive secretary, 693 Sutter Street, San Francisco 94102.

APRIL MEETINGS

April 2-4—**Annual Postgraduate Assembly in Anesthesiology.** Sponsored by the Anesthesia Section of the Los Angeles County Medical Association. International Hotel, Los Angeles. Friday-Sunday. $20. Contact: Joseph L. Cadranel, M.D., secretary, 9430 Kirkside Road, Los Angeles 90035.

April 4-8—**Annual Clinical Meeting of the American College of Obstetricians and Gynecologists.** Civic Auditorium, San Francisco. Sunday-Thursday. Contact: Robert A. Kimbrough, M.D., director, 79 West Monroe Street, Chicago 60603.

April 9-15—**American Academy of General Practice.** San Francisco. Friday-Thursday. Contact: Mac F. Cahal, J.D., Volker Boulevard at Brookside, Kansas City 12, Mo.

Postgraduate Education

Audio-Digest Foundation

Audio-Digest Foundation (a non-profit subsidiary of the California Medical Association) provides by subscription twice-a-month tape-recorded summaries of leading national meetings and authoritative surveys of current literature. Seven separate services in: General Practice, Surgery, Internal Medicine, Obstetrics-Gynecology, Pediatrics, Anesthesiology, and Ophthalmology. A new Catalog of outstanding lectures and panel discussions in all areas of medical practice is also available. For information, write: Mr. Claron L. Oakley, Editor, 619 South Westlake Avenue, Los Angeles.

Presbyterian Medical Center

December 12—**Minor Surgery, Office and Hospital.** Saturday. 8 hours. $25.

January 9—**Office Diagnosis and Treatment.** Saturday. 8 hours. $25.

January 23—**Diabetes Mellitus.** Saturday. 8 hours. $25.

February 6—**Current Dermatologic Therapy.** Saturday. 8 hours. $25.

March 6-7—**Operable Heart Disease Annual Conference.** Saturday-Sunday. 16 hours. $35.

March 13-14—**Cancer Conference.** Saturday-Sunday. 16 hours. $25.

March 20—**Treatment of Fractures.** Saturday. 8 hours. $25.

March 27—**Progress in Pediatrics.** Saturday. 8 hours. $25.

For information contact: Arthur Selzer, M.D., chairman, Education Committee, Presbyterian Medical Center, Clay and Webster Streets, San Francisco 94115. WEst 1-8000.

University of California at Los Angeles

November 20-21—**Surgical Techniques Utilizing the Isolated Intestinal Segment in Urological Procedures.** Friday-Saturday. 8 hours. $175.

November 30-December 11—**Prosthetics-Orthotics.** Monday-Friday. 90 hours. $200.

December 5-6—**Medical Economics.** Santa Barbara. Saturday-Sunday. 13 hours. $35.50, includes 2 lunches.

December 14-18—**Child Amputee Prosthetics.** Monday-Friday. 45 hours. $125.

January 13-17—**Controversial Areas in Surgery.** Riviera Hotel, Palm Springs. Wednesday-Sunday. 16 hours. $100.

January 13-May 12—**Teaching Clinics in Psychiatry.** Wednesday evenings. 36 hours. $25.

January 17-20—**Chemotherapy.** Riviera Hotel, Palm Springs. Sunday-Wednesday. 12 hours. $100.

February 1-2—**Practical Application of Neuroradiological Techniques.** Monday-Tuesday. 12 hours. $50.

February 3-7—**Gastroenterology.** Riviera Hotel, Palm Springs. Wednesday-Sunday. 16 hours. $100.

February 6-7—**Venereal Disease.** Saturday-Sunday. 12 hours.*

February 11-April 1—**Bedside Clinics in Internal Medicine.** Harbor General Hospital, Torrance. Thursday evenings. 16 hours. $60.

February 12-14—**Geriatric Anesthesia.** Harbor General Hospital, Torrance. Friday-Sunday. 18 hours.*

February 17-April 7—**Medical Economics.** Wednesdays. 16 hours. $35.

February 27-28—**Early Management of Acute Trauma.** Saturday-Sunday. 12 hours.*

February 20—**Concepts of Mental Health Consultation.** Saturday. 7 hours. $25.

March 6-7—**Surgical Techniques for Degenerative Hip Disease.** Saturday-Sunday. 12 hours.*

March 12-14—**Cardiology.** Friday-Sunday. 16 hours.*

April 5-16—**Prosthetics-Orthotics.** Monday-Friday. 90 hours. $200.

April 7-10—**Emergency Care of the Sick and Injured.** Wednesday-Saturday. 24 hours. $20.

For information on courses for physicians or ancillary personnel contact: Thomas H. Sternberg, M.D., Assistant Dean and Head, Department of Continuing Education in Medicine and Health Sciences, U.C.L.A. Medical Center, Los Angeles 90024, 478-9711, Ext. 2114.

*Fee to be announced.
†Hours to be announced.

Loma Linda University

As Arranged—**Traineeships** in clinical and other departments are available by arrangement with department chairmen of the Postgraduate Division. 80 hours minimum.

Anesthesia, 6 months. 250-300 hours. $350.

Pulmonary Diseases—can be arranged.

Continuously—**Illustrated Medical Lectures:** 30-minute tape recordings and accompanying 35-mm filmstrip, 50 to 80 full-color pictures for screen, hand or desk viewer. Available individually or by subscription. 12 or 36 titles per year, all titles produced in one year in any chosen specialty. Projectors and viewers included in subscription plans. Contact: Loma Linda University, Illustrated Medical Lectures, Los Angeles 33.

For course information contact: W. F. Norwood, Ph.D., Assistant Dean and Chairman, Division of Continuing Education, Loma Linda University School of Medicine, 1720 Brooklyn Ave., Los Angeles, California 90033, ANgelus 9-7241, Ext. 214.

University of California, San Francisco

November 21-22—**Epilepsy: Problems of Diagnosis and Management.** 14 hours. $40.

November 21-22 — **Problems in Community Mental Health.** Saturday-Sunday.*†

November 22-24—**Neurology.** Sunday-Tuesday.*†

December 2-5—**Retinal Diseases: A Symposium on Differential Diagnostic Problems of Posterior Uveitis.** Wednesday-Saturday. 25 hours. $85.

December 4-5—**Basic Electrocardiography.** Friday-Saturday. 12 hours. $40.

December 12-13—**Psychiatric Perspectives in Medicine.** Stockton State Hospital. Saturday-Sunday. 13 hours. $10.

January 9—**Current Practices and Future Trends in Obstetrics.** Children's Hospital, San Francisco. Saturday.*†

January 9-February 13—**Postgraduate Seminars in Clinical Sciences.** Mercy Hospital. Saturday mornings. 12 hours. No fee.

January 16-17—**Biopsy and Aspiration Techniques in Diagnosis.** Saturday-Sunday.*†

February 1—**Medical Aspects of Well Being.** Monday.*†

February 3-5—**Aviation Medicine Seminars.** Del Webb's TowneHouse, San Francisco. Wednesday-Friday.*†

February 11-13—**Pediatric Ophthalmology.** Thursday-Saturday.*†

February 15-19—**Course for Physicians in General Practice.** Mount Zion Hospital, San Francisco. Monday-Friday.*†

February 18-20—**Skin Bacteria and Their Role in Infection.** Thursday-Saturday. 15 hours. $35.

February 20-22—**Selecting Children for Special Educational Services.** Saturday-Monday.*†

February 26-27—**Clinical Neurology.** Friday-Saturday.*†

February 27-28—**Neuropsychiatric Management in Daily Practice.** Modesto State Hospital, Modesto. Saturday-Sunday.*†

March 10-14—**Diagnostic Radiology.** Wednesday-Sunday.*†

March 13—**Demonstrations in Clinical Hematology.** Children's Hospital, San Francisco. Saturday. *†

March 13-14—**Neuropsychiatry in Daily Practice.** Agnews State Hospital, San Jose. Saturday-Sunday.*†

April 2-4—**Proctology.** Friday-Sunday.*†

April 10-11—**Clinical Considerations in Mental Retardation.** Sonoma State Hospital, Eldridge. Saturday-Sunday.*†

April 22-24—**Inheritable Endocrine and Metabolic Diseases: Prevention, Detention, and Treatment.** Thursday-Saturday.*†

April 24-25—**Neuropsychiatry for the Non-Psychiatric Physician in General Practice.** Sutter Memorial Hospital, Sacramento. Saturday-Sunday.*†

April 29-May 1—**Ear, Nose, Throat.** Friday-Saturday.*†

April 30-May 1—**Pediatrics.** Friday-Saturday.*†

Continuously—Courses presented by special arrangement: **Principles and Clinical Uses of Radioisotopes** (full time, one to three months).

For information on courses for physicians or ancillary personnel, contact: Seymour M. Farber, M.D., Assistant Dean, Dept. of Continuing Education in Medicine and Health Sciences, University of California Medical Center, Room 565-U, San Francisco 94122, MOntrose 4-3600, Ext. 179.

University of Southern California

November 11-January 13—**Recent Developments in Psychotherapy.** Wednesdays. 16 hours. $55.

December 2-February 17—**Psychosomatic Case Conferences.** Los Angeles County Hospital. Wednesdays. 20 hours. $25.

December 4-6—**Sociology and the Psysician—A Seminar.** Riviera Hotel, Palm Springs. Friday-Sunday. 9 hours. $35.

December 11-13—**Water and Electrolyte Balance.** El Mirador Hotel, Palm Springs. Friday-Sunday. 22 hours. $60.

January 6-March 10—**Psychosomatic Pediatric Case Conferences.** Children's Hospital. Wednesdays 8:00-10:00 p.m. 20 hours. $55.

January 8-10—**Adolescence.** El Mirador Hotel, Palm Springs. Friday-Sunday. 22 hours. $60.

January 21-22—**New and Old Antibiotics.** Los Angeles County Hospital. Thursday-Friday. 15 hours. $35.

January 29—**Nuclear Medicine.** Los Angeles County Hospital. Fridays, 4:00-5:00 p.m.

February 2-April 20—**Bedside Cardiology.** Los Angeles County Hospital. $80.†

February 12-14—**Spatial Electrocardiography.** El Mirador Hotel, Palm Springs. Friday-Sunday. 22 hours. $60.

February 19-21—**Neurological Procedures and Principles Useful in Internal Medicine.** Los Angeles County Hospital. Friday-Sunday. 22 hours. $65.

February 24—**Shock Symposium.** Statler Hilton Hotel, Los Angeles. Wednesday. 7 hours. $25.

February 25-26—**Pulmonary Disease.** Beverly Hilton Hotel, Beverly Hills. Thursday-Friday. 14 hours. $45.

March 3-May 19—**Introduction to Family Therapy.** Los Angeles County Hospital. Wednesdays. 24 hours. $35.

March 3-May 19—**Doctor-Patient Communication: A Laboratory Course.** Los Angeles County Hospital. Wednesdays. 24 hours. $25.

April 8-June 10—**Ward Walks in Rare Diseases.** Los Angeles County Hospital. Thursdays. 20 hours. $105.

April 8-9—**Current Concepts in Obstetrics and Gynecology.** Statler Hilton Hotel, Los Angeles. Thursday-Friday. 14 hours. $45.

Continuously—**Basic Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $100. Physicians may register at any time.

Continuously—**Advanced Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $85. Physicians may register at any time.

For course information contact: Phil R. Manning, M.D., Assoc. Dean, Postgraduate Division, USC School of Medicine, 2025 Zonal Ave., Los Angeles 90033, CApital 5-1511, Ext. 300.

TO HAVE YOUR MEETING OR PROGRAM LISTED IN CALIFORNIA MEDICINE

FILL OUT AND MAIL THIS BLANK TO THE ADDRESS GIVEN

(COPY MUST BE **RECEIVED** NOT LATER THAN THE **FIFTH OF THE MONTH PRECEDING** ISSUE)

Continuing Medical Education, California Medical Association

693 Sutter Street, San Francisco, California 94102

NAME OF ORGANIZATION_____

MEETING OR PROGRAM_____

DATE_____ TIME_____

PLACE_____ FEE, IF ANY_____

CONTACT FOR INFORMATION:_____

(give name, title, address)

California Medical Association

Committee on Continuing Medical Education
15th Annual Postgraduate Institutes, 1965

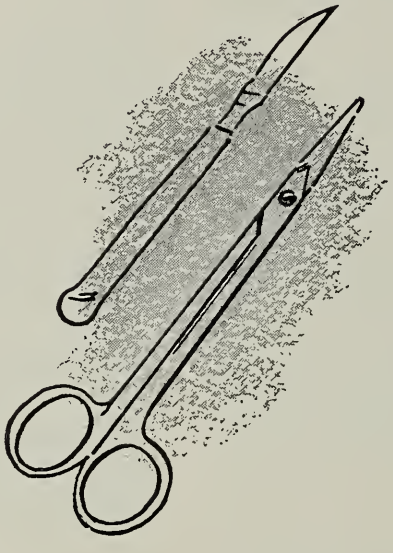
February 25-26—**SOUTHERN COUNTIES,** in cooperation with Stanford University School of Medicine. **"Advances in Therapeutics."** Disneyland Hotel, Anaheim. Chairman: Edward Shanbrom, M.D., Orange County General Hospital, 101 South Manchester, Orange.

March 12-13—**WEST COAST COUNTIES,** in cooperation with University of California School of Medicine, San Francisco. Del Monte Lodge, Pebble Beach. Chairman: William B. Wenner, M.D., 726 Cass Street, Monterey.

May 27-28—**SAN JOAQUIN COUNTIES,** in cooperation with USC School of Medicine. Ahwahnee Hotel, Yosemite. Chairman: Howard Corbus, M.D., 1300 North Fresno, Fresno.

June 24-26—**SACRAMENTO VALLEY COUNTIES,** in cooperation with UCLA School of Medicine. Harvey's Resort Hotel, Lake Tahoe. Co-Chairmen: Dixon L. Hughes, M.D., 3320 White Oak Court, Sacramento; Philip J. Reilly, M.D., 6437 Fair Oaks Boulevard, Carmichael.

For information regarding Postgraduate Institutes and Circuit Courses, Contact: Continuing Medical Education, California Medical Association, 693 Sutter Street, San Francisco 94102. PRospect 6-9400, Ext. 68.



The Physician's BOOKSHELF



INFECTIOUS DISEASES OF CHILDREN—Third Edition—Saul Krugman, M.D., Professor and Chairman, Department of Pediatrics, New York University School of Medicine, New York, N.Y.; Director of Pediatrics, Bellevue Hospital Center, New York, N.Y.; Director of Pediatrics, University Hospital, New York, N.Y.; Robert Ward, M.D., Professor and Chairman, Department of Pediatrics, University of Southern California School of Medicine, Los Angeles, Calif.; Physician-in-Chief, Childrens Hospital, Los Angeles, Calif. The C. V. Mosby Company, Saint Louis, 1964. 423 pages, $15.75.

The third edition of this volume follows the publication of the second edition by four years. The chief changes are the following:

Two new chapters are devoted to acute respiratory disease, one on etiology, the second on manifestations and treatment. The rhinoviruses, Eaton agent myxoviruses, adenoviruses, picornaviruses and others are discussed.

There is a new chapter on cytomegalic inclusion disease.

The use of live virus vaccines for the presentation of poliomyelitis and measles is detailed, as well as data on recent developments in the natural history of rubella and the isolation of its viruses.

The role of methisazone in treating smallpox and of IDU in treating herpes simplex infections of the eye is described.

New developments in treating bacterial meningitis and staphylococcal infections and the use of the newer penicillins is detailed.

The volume remains one of the leading texts on infectious diseases of children, up-to-date, carefully edited and printed, and containing ample references at the end of each chapter.

WILLIAM C. DEAMER, M.D.

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CLINICAL USE OF DEXTRAN SOLUTIONS—Amiel Segal, B.A., Department of Hematology, Walter Reed Army Medical Center, Walter Reed Army Institute of Research, Washington, D.C. Foreword by Col. William H. Crosby, M.C. Grune & Stratton, New York and London, 1964. 74 pages, $4.50.

This monograph reviews in a concise manner the pharmacology and clinical uses of the dextrans. Appropriate attention is directed to the major distinctive beneficial and adverse effects of high and low average molecular weight solutions. Potential adverse side effects apart from hemostatic disorders induced by dextrans are covered briefly.

Clinical uses in hypovolemic states is given good coverage with supportive data from animal experiments and patient series. Less complete documentation is provided for its application in a wide variety of situations (nephrotic syndrome, paroxysmal nocturnal hemoglobinuria, prolonged ischemia, vascular occlusion, hypothermia, cardiovascular surgery, transfusion reactions, and sickle cell anemia) but references to the literature are provided in detail.

The author appears enthusiastic about the potential value and relative safety of the low molecular weight dextrans, but he appropriately notes that reports to the date of his monograph are of a preliminary nature. Complications arising in the use of low molecular weight dextrans are cited in the author's addended bibliography.

The author appears enthusiastic about the clinical utility of the dextrans, and minimizes toxicity to an extent greater than most current opinion. The monograph does serve as a reference source for basic data concerning the dextrans, and provides a detailed bibliography.

HOWARD F. MORRELLI, M.D.

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CHRISTOPHER'S TEXTBOOK OF SURGERY—Eighth Edition—Edited by Loyal Davis, M.D., Professor of Surgery, Northwestern University Medical School. W. B. Saunders Company, Philadelphia and London, 1964. 1481 pages, $18.50.

Christopher's Textbook of Surgery has been an outstanding textbook for students of surgery over the past several decades. The recent editions have been revised and edited by Loyal Davis. The current 8th Edition of Christopher's Textbook of Surgery remains an outstanding surgical text which has been extensively revised and brought up to date in all areas of major surgical interest. The book costs $18.50, comprises 1481 pages, and contains over 1300 illustrations.

The initial eight chapters of the book cover the history of surgery, wound care, infections, shock, principles of preoperative and post-operative care, surgical metabolism and electrolyte balance, anesthesiology, thermal and radiation injuries. Regional surgical problems are then discussed, including the head, neck, breasts, thorax, lungs, heart, abdominal wall, alimentary canal, liver, pancreas and spleen. Surgical endocrinology is included, with chapters on the thyroid, parathyroid and adrenals. Specialty surgery includes genito-urinary surgery, gynecology, orthopedics, physical medicine and rehabilitation, neurosurgery and vascular surgery. The concluding four chapters of the book are on qualifications of the surgeon, surgical judgment and horizons in surgery.

Each of the 33 chapters is written by a separate author, but the continuity of the book is excellent, and the presentation of material is in a uniform fashion with minimal overlapping of material presented.

This latest edition remains an outstanding textbook in surgery, and it is remarkable how well each section material is presented, and how up to date the concepts in each chapter have been developed in an effort to familiarize the reader with the best of surgical care for a given problem. Basic sciences as they relate to surgical diagnosis and therapy are well reviewed in each section of the book, and help students approach surgical knowledge from a biochemical standpoint.

This book remains one of the outstanding textbooks of surgery in American literature, and each section is written by an authority in a given field. This textbook can be recommended to students, residents and practicing physicians alike, and certainly should be available in the libraries of every teaching hospital.

VICTOR RICHARDS, M.D.

MODERN TREATMENT—Volume 1, Number 4, July 1964—Treatment of Inectious Diseases—Lowell A. Rantz, M.D., Guest Editor. Harper & Row, Publishers (Hoeber Medical Division), New York, 1964. Bimonthly Publication, by subscription only; 6 books a year; $16.00 per year (laminated paperback); 1033 pages.

Dr. Lowell A. Rantz, Pofessor of Medicine at Stanford and for a quarter of a century a leading and guiding spirit in the field of infectious diseases, died suddenly on June 5, 1964. His unexpected death at the peak of his career is a severe loss to medicine, especially in California. The symposium on "Treatment of Infectious Diseases" may stand as a suitable memorial to Dr. Rantz. He conceived the idea and selected the topics and collaborators in 1962, edited the manuscripts, and finished the book shortly before his death. The volume is a good summary of the field in 1963, presented by a dozen authors. The contributions range from scholarly discussions of the pharmacology of antibiotics to a series of "how to" articles dealing with the management of important infectious disease entities. Many physicians will find this a valuable brief and specific guide.

ERNEST JAWETZ, M.D.

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BAILEY'S TEXTBOOK OF HISTOLOGY—Fifteenth Edition—Revised by Wilfred M. Copenhaver, Ph.D., Professor of Anatomy, College of Physicians and Surgeons, Columbia University. The Williams & Wilkins Company, Baltimore 2, Md., 1964. 679 pages, $13.50.

This venerable textbook of histology (first edition in 1904) is a product of the college of Physicians and Surgeons of Columbia University. It was greatly improved in the eighth edition when the anatomy staff of P and S assumed the responsibility for revising it. Subsequent editions have shown continuous improvement, culminating in the current fifteenth edition. As in earlier editions the text is eminently readable and beautifully organized. The two columns per page format reduces eye fatigue. In each chapter core information is presented first and siginficant detail skillfully built upon this firm foundation. Many important advances in knowledge of histological ultra structure and histochemistry have been woven skillfully into the fabric of the text without detracting from the organizational unity of presentation. The book contains an abundance of excellent illustrations, many of them in color. They are fully labelled, without the use of abbreviations or keys, accompanied by descriptive legends and consistently referred to in the text.

As in previous editions, and in competing textbooks, this volume stresses the cell as the structural and functional unit of the multicellular organism. Differentiation is memtioned as leading to the formation of tissues (groups of specialized cells) during proliferation in the developing embryo. Since histology is recognized as the study of these tissues, the process of differentiation is fundamental to the subject, and deserves much more than a casual mention in the introduction. The final section in the chapter on Epithelia, named "Membranes" (page 67) starts out with "Epithelium assumes its full significance only when considered in conjunction with the underlying connective tissue." This is an exceptionally appropriate and significant statement and should have a place in every textbook of histology, since, as experimental embryologists have realized for many years, differentiation and maintenance of epithelia are dependent upon the intimate relationship between these two tissues. This is one of the basic facts of functional histology and it is to be regretted that after having stated it the book fails to amplify it in other than strictly static morphological terms. The same failure, however, is evident in all other current editions of American textbooks of histology. Another appropriate place in which it might be discussed is on page 333, in connection with the embryology, growth and replacement of hair.

In spite of the excellent and logical organization of subject matter in this edition, chapter headings are not entirely consistent with content, e.g., Chapter 2, The Living Cell, might well be a subdivision of Chapter 1, The Cell; and Chapters 6, Cartilage and Bone, and 7, Blood and Lymph, might better be subdivisions of Chapter 5, The Connective Tissues. Chapters concerned with organ description are for the most part entitled Systems (Chapters 12, The Circulatory System; 16, The Digestive System; 17, The Respiratory System; 18, The Urinary System; and 19 and 20, The Male and Female Reproductive Systems, respectively). There would seem to be no good reason why the same nomenclature should not be used consistently (Chapters 13, Lymphatic Organs; 14, The Integument; 21, The Endocrine Glands, and even 22, The Organs of Special Senses). As in other histology texts, the distinction between tissues and organs is not clearly stated.

The chapter on epithelia avoids the adrenal cortex and medulla, buccal hypophysis, parathyroid glands, pancreatic islets, corpus luteum and liver. Because these structures pose a special problem in the structural nomenclature of epithelia is no excuse for ignoring them. The first paragraph of the chapter points out that in some instances epithelial ingrowths may lose their free surfaces and their connection with the parent epithelia. It should be acceptable, therefore, to classify most of these specific examples as belonging to simple or stratified cuboidal epithelia.

In the study of pseudostratified epithelium it is useful to observe differences in shape, size and density, as well as the difference in location, of nuclei, of columnar and basal cells; such differences should be included in the description. As in other editions simple cuboidal epithelium is considered as a type of simple columnar epithelium.

In the otherwise excellent text a few minor blemishes occur, e.g., sinusoids are sometimes referred to as sinuses, e.g., page 89. Since all connective tissues are fibrous, this term has been discarded in the revised classification of connective tissues presented on page 69, however, it is still used on page 396. The last sentence on page 117, completed on page 118, is very confusing and should be rewritten.

On page 65 keratinization is attributed to "insufficient nutrition of the upper cell layers"; this is questionable for several reasons, among which is the failure of relatively broad bands of epithelial cells to keratinize in basal cell epitheliomas. On page 405, serous demilunes of the salivary glands are described as "crescent-shaped" groups of serous cells, referring to their sectioned appearance only; three dimensionally they are cup-shaped. There is no mention of the tendency of mucous cells to be arranged as tubules rather than as acini (page 402). Although the structure of the pars intermedia of the pituitary gland is well described, no mention is made of its function (page 570). The absence of cilia in the olfactory epithelium is not mentioned (page 642). No mention is made of the histological and histochemical distinction between epinephrine and nor-epinephrine-secreting adrenal medullary cells (page 585).

Nothing is included of recent interesting ultrastructural studies of the retina, suggesting a similarity between the fibrillar patterns of cilia and that of rods and cones. The "intranuclear inclusions" (of secretory significance) always demonstrable in healthy, adult ductus deferens epithelium, are not mentioned (page 503). The book contains no illustration of the larynx (page 438). According to the terminology adopted on page 192, the sensory neurones ending peripherally should be referred to as "receptor or

dendritic zones" not as "axones" (page 228); the characteristically rather thick Bowman's membrane of the cornea is referred to as "thin" (page 597), although no mention is made of the relative thickness of the much thinner Descemet's membrane. The use of nomenclature is not always consistent with the recommendations in the 1955 (Paris) revision of the Nomina Anatomica.

The references at the end of each chapter are, on the whole, well selected and representative, although the omission of Parkes' two volume, third edition of Marshall's Physiology of Reproduction is surprising.

The volume contains remarkably few typographical errors (page 35. Benseley for Bensley; page 73, plasmacells for plasma cells; page 586, whicch for which).

The index is good, in spite of the fact that the blood-brain or hematoencephalic barrier mentioned on pages 296, 588 and described on page 242, is not listed under either name.

The average medical student with a good representative collection of histological preparations, an adequate microscope, reasonable motivation and this textbook should be able to learn enough histology in 120 hours to pass any final examination in the subject in any medical school in the U.S.A. without formal instruction. Even with an instructor the use of the lecture room could well be limited to brief orientation and review sessions, to the presentation of special material not covered in the text, and to examinations, leaving more time for laboratory study.

HADLEY KIRKMAN, M.D.

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OUTLINE OF UROLOGY—C. D. Creevy, M.D., Director, Division of Urology, Department of Surgery, University of Minnesota Medical School. With a section on Treatment of Acute Renal Failure by M. P. Reiser, M.D., Clinical Assistant Professor of Surgery (Urology), University of Minnesota Medical School. The Blakiston Division, McGraw-Hill Book Company, New York, Toronto, London, 1964. 385 pages, $7.95.

This book, one of nine so far published in Blakiston's paperback Outline Series, is a well organized expansion of the material used for instructing medical students in urology at the University of Minnesota. It is intended primarily for medical students. However, residents and other practitioners than urologists will find it a handy, up to date reference work in brief form. Each chapter is supplemented with a useful list of references and bibliography. In addition, there is a fairly complete list of available urological text-books and monographs, with pertinent comments about many of them at the end. The book is well illustrated and well indexed. Only one insignificant typographical error was noted.

The subject matter covers the entire field of urological anatomy, physiology, pathology and therapy, including urological instruments and examinations. There is also a good section in similar format on treatment of acute renal failure by M. P. Reiser, M.D. Something unusual in books of this type is the inclusion of concise chapters on "Functional Disturbances of the Urinary Tract and of the Male Genitalia," "Impotence and Sterility," and "Disorders Due to the Abnormal or Deficient Secretion of Sex Hormones (and Related Syndromes)."

In most fields the information is current to 1964. In certain instances, such as cryptorchidism, more sophisticated readers may feel that opinions of too many authors are mentioned without the present author's own opinion as the consensus being given. However, in most cases the author states his own attitude and opinion firmly, as with chronic pyelonephritis and catheterization, thereby making the material more readable and useful. Certain opinions, notably those relating to sterilization of urological instruments, topical anesthesia for the urethra and the best method for aortography and renal arteriography will be challenged by many urologists. However, the student or practitioner who masters the material in this book will indeed be well grounded in urology.

I do not know a book of similar length or one aimed at the same audience that is as current, well written and well organized as Creevy's Outline of Urology.

EARL F. NATION, M.D.

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PHYSICAL EXAMINATION OF THE SURGICAL PATIENT—Third Edition—J. Englebert Dunphy, M.D., F.A.C.S., Professor of Surgery, University of California School of Medicine, San Francisco; and Thomas W. Botsford, M.D., F.A.C.S., Assistant Clinical Professor of Surgery, Harvard Medical School; Senior Associate in Surgery, Peter Bent Brigham Hospital; Associate in Surgery, Children's Medical Center. W. B. Saunders Company, Philadelphia and London, 1964. 396 pages, $8.50.

This is a remarkably simple yet valuable book which focuses its presentation on the art of physical diagnosis, particularly of the surgical patient. Hardly a physician is alive who has not been startled yet pleased at the dramatic clarification of a difficult diagnostic problem by the artful use and combination of the eyes, ears, fingers and brain of the clinician, for physical examination is and will remain truly an art, related to the sensitivity, skill and perception of the individual physician.

But there must be a beginning to every art, an opportunity for the student to absorb the past traditions and at the same time to witness and experience the skillful approach of current artists. The artist becomes a masterful teacher when, through a winnowing and sifting of experience, he can define and communicate his art in simple, comprehensible terms.

Dunphy and Botsford's book on "Physical Examination of the Surgical Patient" translates and communicates the art of physical diagnosis in simple, comprehensible terms to any student or physician and enables them to understand the art and nature of physical diagnosis. It is particularly valuable for students because the principles of the art are presented with simplicity and brevity. Yet it is valuable to all physicians, for the humanistic and imaginative approach to the patient is emphasized rather than the dull and mechanistic approach through excessive dependence upon scientific tools.

This is the third edition of this simple presentation of the principles and techniques of physical examination. The book has been modernized and brought up to date, and includes chapters on cardiac diagnosis, emergency examination of the injured and examination of the burn and traumatized patient. Illustrations are simple and informative, largely straight-line drawings, in accordance with the basic concepts of the book. The book can be strongly recommended, particularly to students of medicine.

VICTOR RICHARDS, M.D.

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BUSINESS MANAGEMENT OF A MEDICAL PRACTICE—Bernard D. Hirsh, LL.B., Director, Law Department, American Medical Association, Chicago, Illinois. The C. V. Mosby Company, Saint Louis, 1964. 190 pages, $7.75.

A lawyer's view, of the practical business aspects, of the practice of medicine.

An up-to-date compendium of advice, that a physician can refer to, for understanding and handling a great variety of problems connected with the management of his professional office and the business affairs connected thereto.

The book is organized in nine chapters, which cover, not

only the different fields of business management of a medical practice, but also such anciliary subjects as Wills, Estate and Gift tax, and a chapter on that great problem that is always present. "The Federal Income Tax." Within each chapter is a series of sections, touching upon individual phases of office management in that general field. Each chapter contains the source of many answers and ideas, that should be extremely helpful to the medical practioner, in establishing and maintaining efficient business procedures in the operation of his professional office.

The author, in organizing his material, has incorporated his years of exposure to the ethical and legal problems of the medical practitioner and his knowledge and experience gained thereby. In addition, the author has included forms and aids to assist the physician in understanding the legal business problems covered by each chapter.

The author has devoted three chapters to subjects pertaining to office-sharing, employing another physician, and partnership agreements, which, in the opinion of the reviewer, are excellent, informative, and provide answers and solutions for the medical practitioner in an area that gives rise to many problems and disputes. Other chapters on, selling a medical practice, buying on credit, hospital contracts, all are extremely informative, well written and will assist and give understanding in these particular situations. The chapters on wills and Federal income tax, I am sure, can be very helpful to guide the physician to a better comprehension and understanding of estate and tax problems.

In reviewing the author's work I have done so as an attorney who has spent many years in advising and assisting physicians in their practice and business affairs. It is my opinion, that the "Business Management of a Medical Practice" would be a valuable, practical addition to the library of all physicians.

FREDERICK O. FIELD

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DRUGS OF CHOICE—1964-65—Walter Modell, M.D., Editor; Associate Professor of Pharmacology, Cornell University Medical College, New York, N.Y.; Attending Physician, Veterans Administration Hospital, Montrose, N.Y.; Chairman, Advisory Committee on New Drugs to the Food and Drug Administration; Member, Executive Committee, United States Pharmacopeia XVII; Editor, Clinical Pharmacology and Therapeutics. The C. V. Mosby Co., 3207 Washington Blvd., St. Louis 3, Mo., 1964. 1018 pages, $16.75.

A book which is revised every two years brings to the reader the latest facts and opinions about clinical uses of drugs, old and new. This latest edition, authored by 47 clinicians and pharmacologists, brings new points of view on five controversial topics by a change of authorship on antibacterial agents, drugs for arthritis and rheumatic diseases, medullary stimulants, drugs for disturbances of equilibrium and drugs used in the treatment of hypertension. Examples of the changes in these five chapters are the emphasis on the invading infectious organism rather than on individual drugs, thus saving time for the physician who need only find the drugs used for the specific infection, rather than searching through all antibiotics and anti-bacterial agents to locate the one most adaptable to the problem at hand; expansion of the chapter on disturbances of equilibrium and a complete revision of the chapter on hypertension.

There is a total of 41 chapters, discussing the choice of drugs for most conditions coming into the experience of most practitioners. The authors are experienced experts in their respective fields, in most instances writing specific instructions for specific conditions. The one chapter which seems to fall short is the discussion of medullary stimulants which gives so little specific information and is so general as to be of little value.

CLINTON H. THIENES, M.D.

STERILITY—The Diagnostic Survey of the Infertile Couple—Third Edition—Walter W. Williams, M.D., F.A.C.O.G., Clinical Geneticist. Published by Walter W. Williams, M.D., Springfield, Mass., 1964. 515 pages, $28.50.

This book is divided into four sections dealing with: (1) the minimal diagnostic program for an infertility study, (2) special diagnostic and therapeutic procedures, (3) a series of unrelated short chapters by well known specialists in the given areas of the field, many from outside the United States, (4) contributions to infertility studies by Walter Williams. Because of this somewhat artificial arrangement the subdivisions of the subject are treated in chapters scattered through the volume resulting in some duplication and difficulty for the reader in obtaining a unified picture. Seminal biochemistry and spermatic cytology are covered quite well, reflecting the author's forty years' interest in the subject in both cow and man. The material, however, is scattered throughout the book in fourteen separate chapters.

According to the introduction, the volume is not intended as a general reference book or compendium on infertility but rather as a clinical manual intended to provide a diagnostic program for those interested in a systematic study of the infertile couple under conditions pertaining to the private practice of medicine. This goal is fulfilled in the first two sections of the book which read like a do-it-yourself home study course in infertility and provide step by step directions on the performance of uterotubal insufflation, gynecography, semen analysis, etc.

One wonders how much of the relatively high cost of this book represents the cost of the final section which is entitled "Contributions to Infertility Studies by Walter W. Williams, A.B., M.D., D.V.M., F.A.C.O.G." This section contains the author-publisher's bibliography with complete reprints of several of his early publications, lists of his society affiliations and awards, and several full page photographs of the more interesting awards and honors. This section contains twice as many pages as the total devoted to the therapy of male infertility, vaginal cytology, the hypothalmus and pituitary, culdoscopy, and tuboplasty to mention a few of the subjects covered rather briefly.

In summary, if one is asked to pay $28.50 for a scientific book he should expect to be told more about the subject and less about the author.

EMMET J. LAMB, M.D.

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PROBLEMS OF DYNAMIC NEUROLOGY—An International Volume—Studies on the Higher Functions of the Human Nervous System—Edited by Lipman Halpern, Jerusalem. Published by the Department of Nervous Diseases of the Rothschild Hadassah University Hospital and the Hebrew University Hadassah Medical School, Jerusalem, Israel, 1963. Distributed in the United States by Grune & Stratton, New York. Publication Date: 1964. 509 pages, $15.00.

This volume is a review of neurological concepts principally in the field of aphasia. The title is somewhat enigmatic but its semantic significance is elucidated by Walter Riese in the Historical Review of Dynamic Neurology. Chapters on the Physiological Basis in Perception and Speech by Denny-Brown, Aphasia and Conceptional Thinking by Bay, Disorders of Prosody by Monrad-Krohn, Aphasia in Polyglots, Amusias by Werthiem, Gestural and Mimic Language by Macdonald Critchley, Problems concerning the Agnosias, Apraxias, and Aphasia by Alajouanine and Lhermitte, The Sense of Direction and the Arrow-form by Gooddy and Reinhold, Anosognosia by Weinstein and Cole, are fairly comprehensive and interesting reviews on various aspects of aphasia. Bender has a detailed and large chapter on Disorders of Visual Perception which is of considerable value. Other chapters consider pain, neurobiological effects of colors, posture and psyche, prosopagnosia and

other aspects of aphasia by authors all important in these fields. This book is a must for anyone interested in the field of communication disorders and neurology of cortical function. It seems a little expensive for its size and dearth of illustrations.

HOWARD S. BARROWS, M.D.

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PROGRESS IN MEDICINAL CHEMISTRY—Volume 3—Edited by G. P. Ellis, B.Sc., Ph.D., F.R.I.C., Department of Chemistry and Biology, Welsh College of Advanced Technology, Cardiff; and G. B. West, B.Pharm., D.Sc., Ph.D., School of Pharmacy, University of London. Butterworth Inc., Washington, D.C., 1963. 407 pages, $15.75.

This book will be read with much interest and profit by organic and pharmaceutic chemists, pharmacologists and toxicologists, and practitioners in specialties related to the subjects of the seven chapters. Each chapter is by experts in the field reviewed and attempts have been made to link chemical structure with biologic activity. There are seven chapters which review the literature on neuromuscular blocking agents, chemotherapy of trypanosomiasis, antitussive drugs, rauwolfia alkaloids, statistics for pharmacologic and toxicologic screening, anticonvulsants and local anesthetics.

Of the eleven authors, two of them, like the editors, are from British or Canadian universities, the remainder are from research laboratories of pharmaceutical manufacturing companies of Great Britain, Canada and the United States of America. The emphasis varies from detailed description of the chemical structure in relation to neuromuscular blocking action in Chapters 1 and 2 and a purely mathematical treatise on statistics of toxicological screening in Chapter 5 to a more pharmacodynamic discussion of local anesthetics in Chapter 7. Throughout the book, the emphasis is on experimental pharmacology rather than clinical use of drugs. Each chapter has an extensive bibliography, ranging from 97 references for the chapter on statistics to 640 references for the chapter on anticonvulsants.

CLINTON H. THIENES, M.D.

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TEXTBOOK OF PEDIATRICS—8th Edition—Edited by Waldo E. Nelson, M.D., D.Sc., Professor of Pediatrics, Temple University School of Medicine and Woman's Medical College of Pennsylvania; with the Collaboration of Eighty-five Contributors. W. B. Saunders Company, Philadelphia, 1964. 1636 pages, $18.00.

The rapidity and scope of new developments in medicine, and particularly in pediatrics are evident in the fact that this new, eighth edition of Nelson's standard Textbook of Pediatrics is 174 pages longer and half a pound heavier than its immediate predecessor which appeared only five years ago. The difference represents much new material and extensive revision of old. Eighty-five contributors are listed, not counting the Editor who has written a considerable number of pages himself. The general level of professional competence in the authors is high.

New sections, by new authors, include nearly 100 pages on growth, development, and problems of fluid and electrolyte balance; a revised and expanded section, a most useful one, on drugs, with 41-page table of dosages and preparations; a much needed discussion of the rapidly growing field of chromosomal anomalies and disorders, and of the also fast growing list of inborn errors of metabolism; a new section on unclassified mycobacteria, which have been widely reported of late; an expanded section of virus diseases, including recent developments in prophylaxis of measles and poliomyelitis; a description of the now well-established therapy of coccidioidomycosis with Amphotericin B; a considerably enlarged section on endocrine disturbances; and numerous other additions and updatings. It is clear that the important advances in the pediatric field during the last half-decade have been quite thoroughly covered.

The index, a particularly satisfactory feature of all editions of the Nelson text, has been correspondingly lengthened.

The new edition is highly recommended to students and practitioners alike.

HAROLD K. FABER, M.D.

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SCIENCE AND PSYCHOANALYSIS—Volume VI: Violence and War with clinical studies—Edited by Jules H. Masserman, M.D., Professor of Neurology and Psychiatry, Northwestern University, Chicago; and President, Academy of Psychoanalysis 1958-59. Grune & Stratton, Inc., 381 Park Avenue South, New York 16, N.Y., 1963. 284 pages, $8.75.

In this day and age, when modern man is preoccupied with, and terrorized by the thought that some incident will trigger a nuclear holocaust, this book represents an attempt by the social science class (to this I would add the clinician) to conceptualize, objectify and understand the dynamic network of violence, fear, aggression, etc. in which we are all imbedded.

The people in places of authority, in various countries throughout the world, are searching desperately for answers to questions which have been the eternal plague of mankind. No longer can warfare be glorified and luxuriated in. The days of warfare as a quick and easy solution are near an end as today's issues are infinitely complex and not simply black or white. In this dilemma the politician, soldier, statesman is frequently immobilized and ineffective. He therefore, more and more, is looking to the social scientist for help. The latter too often is reluctant to involve himself in this problem solving, perhaps distrusting his ability to solve, but the urgency of the age demands joint participation of the social scientist and statesman, no matter how uneasy the alliance may be.

The heart of this book is the Symposium on War and Violence, the rest of the book dealing with the more traditional psychoanalytic aspects of clinical research and therapeutic technique. It is unfortunate that the book contains the latter two sections as they are quite unrelated to the title and major theme of the book. I will thus, in this review, speak mainly of the section on War and Violence. The other sections are interesting, but mention of them, as in the book, takes away from the dramatic presentations on the major book theme.

I will review briefly some of the keystone chapters and end with some of the Symposium's final conclusions. In the opening chapter, Rioch attempts to recall and integrate some of the historical, socio-cultural, ethological and neurophysiological data about violence and fighting. He indicates that there is a complex interaction between seemingly fixed neural behavior patterns and environmental dynamics that may explain variations seen in violent type behavior. He makes a strong case for the importance of interdisciplinary investigation into this area, as the chances of answers from one field are unlikely.

Eibl-Eibesfeldt writes in another chapter about ritualized fighting in animals. He points out some of the factors stimulating or arousing aggressive behavior, the survival value of this behavior and behavior eliciting submissive attitudes. He further compares man and beast, and sees similarities. Man, unfortunately, in modern warfare does not participate much in direct confrontation and thus has few opportunities to allow for innate submissive-aggressive behavior to emerge.

Coser, in still another paper, writes effectively about the concept of relative deprivation. He states that when a

group feels totally deprived they do not strive, however, when they recognize an achievement opportunity, the feeling of relative deprivation becomes pre-eminent and motivates them frequently to violence to achieve a desired end.

Lief describes three types of violence in his paper. They are: (1) The type driven by rage (i.e. cannabalism); (2) a detached type wherein the process not the object is significant. (i.e. gang violence) and (3) a detached type in which the destruction of the object is all important (i.e. nuclear warfare). He states that violence is universal, but warfare need not be a final outcome.

In general the authors conclude that violence and aggressivity are here to stay, but the question is how to modify and redirect this urge. A few solutions are entertained such as early education, a strong third force (i.e. armed U.N.), increased emphasis on international competitive sports, etc., but they all seem woefully inadequate. What is significant in this book is the brave attempt to understand complex behavior such as violence from many disciplinary points of view. We should continue to support efforts typified by this book and not allow the inadequacy of our solutions to deter us from further investigation and perhaps better solutions in the future.

J. Alfred Cannon, M.D.

* * *

TOWARDS EARLIER DIAGNOSIS—A Family Doctor's Approach—Keith Hodgkin, B.M., B.Ch.(Oxon), M.R.C.P.(Lond.), General practitioner, Redcar, Yorkshire; Member of M.R.C. committee for research in general practice. Foreword by Sir Robert Platt, Bart., M.Sc. (Manch.), M.D., F.R.C.P., Professor of Medicine, University of Manchester. The Williams and Wilkins Co., Baltimore 2, Md., exclusive U.S. agents, 1963. 459 pages, $6.50.

Dr. Keith Hodgkin has a panel practice of 2,500 in a small town in Yorkshire. His book narrates every incident of illness for 10 years during his National Health Practice —from "Abscess, Bartholin" to "Wisdom teeth, impaction."

Common problems in recognition of diseases in early stages are emphasized by pithy sentences covering alternate diagnoses, salient features and possible complications.

In descending order of frequency, incident rates of suspected diagnoses per 1,000 N.H.S. patients per year ranged from influenza (182 cases) to congenital polycystic kidney (1 in 10 years).

A very brief appendix of the author's treatment recommends referral of all but the most elementary medical problems. Advocates of socialized medicine may find this section of the book a bit frightening.

Hospital house officers (and possibly the isolated practitioner) should find this book moderately helpful. The meticulous recording of detail would delight the hospital record room librarian. The modest cost ($6.50) will encourage purchase by the casual reader.

James E. Reeves, M.D.

* * *

SURGICAL CLINICOPATHOLOGICAL CONFERENCES OF THE MASSACHUSETTS GENERAL HOSPITAL—Benjamin Castleman, M.D., Chief, James Homer Wright Pathology Laboratories, Massachusetts General Hospital; Professor of Pathology, Harvard Medical School; and John F. Burke, M.D., Assistant in Surgery, Massachusetts General Hospital; Instructor in Surgery, Harvard Medical School. Little Brown and Company, Boston, 1964. 249 pages, $12.50.

The Clinical Pathological Conference, today an almost universally used method of teaching in American medicine, originated in the mind of the late great Dr. Walter B. Cannon when he was a student at Harvard Medical School. In March 1900, he presented a paper entitled "The Case System in Medicine." His idea was adopted by a number of his colleagues, particularly, Dr. Richard C. Cabot, who, more than anyone else, was responsible for its propagation and popularity. (The reviewer remembers with great pleasure participating in this kind of exercise as a student with Dr. Cabot.)

The Clinical Pathological Conference has changed in format but, to quote Paul D. White's introduction, "it remains an exercise in reasoning and clinicopathological correlation. Unfortunately, in some hospitals cases impossible to diagnose are selected, and for that reason the CPC has been adversely termed "a guessing game," but that is not true if the case is selected wisely. The properly chosen case lends itself to a discussion of the differential diagnosis, with clinical clues suggesting the correct diagnosis... on the rare occasions when the correct answer is esoteric or almost unattainable, if the discusser emphasizes the practical clinical problems it doesn't matter if the answer is wrong."

Surgical Clinicopathological Conferences of the Massachusetts General Hospital is a companion volume to a similar one on selected medical cases published in 1960. The editors have selected 50 surgical cases discussed during the past 25 years, mostly within 10 years. In some instances they have, retrospectively, added followup history and further comment in the light of subsequent advances in knowledge of the disease under discussion. Most of the material, of course, first appeared in the New England Journal of Medicine.

This volume makes for good evening reading—as pleasurable to the physician as a book of good detective short stories. The reader's wits are sharpened. He can go through each story at his own pace. He can find it most satisfactory to identify with the discusser who is correct—or have solace in identifying with the high quality of the analyst whose reasoning proves incorrect—or even marvel at the astuteness of the man who correctly shoots down an almost impossible diagnosis. It is recommended reading for all.

Edgar Wayburn, M.D.

* * *

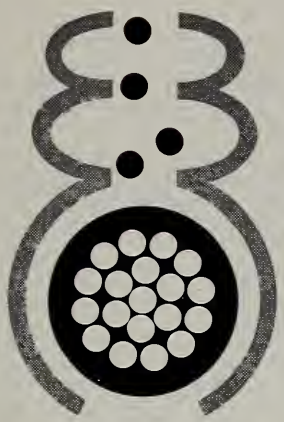
MANUAL OF MEDICAL THERAPEUTICS—Seventeenth edition—Department of Medicine, Washington University School of Medicine, St. Louis, Mo. Current Editors: Robert C. Packman, M.D., and Robert D. Utiger, M.D. Little, Brown and Company, Boston, 1964. 272 pages, $4.50 (paperback).

This typical "medical pocket book" designed for use by senior medical students in a course in medical therapy is naturally also used by house officers. Being edited by successive generations of medical residents it has the advantage of scrutiny by men who presumably have worn out the previous edition in their own pockets. This can also be a disadvantage, however, since it is very difficult to make sound judgments on new drugs without the benefit of considerable experience.

A section on general care of the patient covers hospital orders, fluids, diet, care of the skin and non-specific conditions such as diarrhea, fever, pain, etc. Drug groups not included in chapters on specific diseases are covered briefly here. A separate chapter is allotted to disturbances of body fluids and electrolytes, then follow 15 chapters on specific medical problems (e.g. renal disease, cirrhosis and hepatitis, arthritis) and a chapter on medical emergencies. A short appendix lists the trade and generic names of drugs whose generic names are unfamiliar.

This book is similar to others of its type in that it is a portable ready reference to common medical problems. It is fairly well organized and reasonably up to date. The type is clear and readable but the soft paper cover and spiral binding do not look as if they will wear well.

H. W. Elliott, M.D.



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BOOKS RECEIVED

Books received by CALIFORNIA MEDICINE *are acknowledged in this column. Selections will be made for more extensive review in the interest of readers as space permits.*

BASIC CLINICAL PARASITOLOGY—Second Edition—Harold W. Brown, M.D., Sc.D., Dr. P.H., LL.D. (Hon.); Professor of Parasitology, College of Physicians and Surgeons, Columbia University; Parasitologist, Presbyterian Hospital, New York; and David L. Belding, M.D., Professor of Bacteriology and Experimental Pathology; Emeritus, Boston University School of Medicine. 318 pages, $6.95.

BETTER HEALTH AFTER FIFTY—Edited and Published by The Retirement Council, 551 Fifth Avenue, New York City, A Division of the American Heritage Publishing Co., Inc. Advisor: Edward L. Bortz, M.D., Past President, American Medical Association. Harper & Row, Publishers Incorporated, 49 East 33rd Street, New York 16, N.Y., 1964. 128 pages, $4.50.

DIAGNOSTIC MEDICAL MYCOLOGY—Leanor D. Haley, Ph.D., Associate Professor of Microbiology, Yale University School of Medicine; Director, Nancy Sayles Day Mycology Laboratory, Grace-New Haven Community Hospital, Yale-New Haven Medical Center. Appleton-Century-Crofts, Division of Meredith Publishing Company, 1964. 204 pages, $4.95.

EMERGENCY TREATMENT AND MANAGEMENT—Third Edition—Thomas Flint, Jr., M.D., Associate Physician, Kaiser Foundation Rehabilitation Center, Vallejo. W. B. Saunders Company, Philadelphia, 1964. 686 pages, $8.75.

HANDBOOK OF OBSTETRICS & GYNECOLOGY—Ralph C. Benson, M.D., Professor of Obstetrics and Gynecology, and Chairman of the Department, University of Oregon Medical School, Portland. Lange Medical Publications, Los Altos, 1964. 656 pages, $5.00.

INTRODUCTION TO ELECTROCARDIOGRAPHY—Thos. M. Blake, M.D., Associate Professor of Medicine, University of Mississippi School of Medicine. Appleton-Century-Crofts, Division of Meredith Publishing Company, New York, 1964. 143 pages, $4.95.

MODERN TREATMENT—Volume 1, Number 4, July 1964—Treatment of Infectious Diseases—Lowell A. Rantz, M.D., Guest Editor. Harper & Row, Publishers (Hoeber Medical Division), New York, 1964. Bimonthly Publication, by subscription only; 6 books a year; $16.00 per year (laminated paperback); 1033 pages.

OUTLINE OF PSYCHIATRY FOR STUDENTS AND PRACTITIONERS—Frank Fish, M.B., M.R.C.P., D.P.M., Professor of Psychological Medicine, University of Liverpool. With a Foreword by G. M. Carstairs, M.D., F.R.C.P.E., D.P.M., Professor of Psychological Medicine, University of Edinburgh. The Williams and Wilkins Company, Baltimore, Md., exclusive U.S. agents, 1964. 270 pages, $6.95.

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NEW BOOK

PHYSICAL DIAGNOSIS: A Textbook and Workbook in Methods of Clinical Examination. By Elliot Hochstein, M.D., and Albert L. Rubin, M.D. 409 pages. Illustrated. 1964. Blakiston-McGraw. $12.95.

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OUTLINE OF UROLOGY—C. D. Creevy, M.D., Director, Division of Urology, Department of Surgery, University of Minnesota Medical School. With a section on Treatment of Acute Renal Failure by M. P. Reiser, M.D., Clinical Assistant Professor of Surgery (Urology), University of Minnesota Medical School. The Blakiston Division, McGraw-Hill Book Company, New York, Toronto, London, 1964. 385 pages, $7.95.

PARASITES OF THE HUMAN HEART—B. H. Kean, M.D., F.A.C.P., Associate Professor of Medicine (Tropical Medicine); Cornell University Medical College; and Roger C. Breselau, M.D. Grune & Stratton, Inc., 381 Park Avenue, South, New York 16, N.Y., 1964. 186 pages, $5.00.

PEDIATRIC NEUROLOGY—by 13 Authors—Edited by Thomas W. Farmer, M.D., Professor of Neurology, University of North Carolina School of Medicine, Chapel Hill. Hoeber Medical Division, Harper & Row, Publishers, New York, 1964. 690 pages, $18.50.

POST-LUMBAR PUNCTURE HEADACHES—Wallace W. Tourtellotte, M.D., Ph.D., Associate Professor of Neurology, and Armin F. Haerer, M.D., Teaching Associate of Neurology, University of Michigan Medical School, Ann Arbor, Michigan; Grant L. Heller, M.D., Department of Neurology, Mount Sinai Hospital, Cleveland, Ohio; and John E. Somers, M.D., Clinical Associate in Medical Neurology, National Institutes of Neurological Diseases and Blindness, Bethesda, Maryland. With a Foreword by Russell N. DeJong, M.D., Department of Neurology, University of Michigan. Charles C Thomas, Publisher, Springfield, Illinois, 1964. 120 pages, $5.50.

PRACTICAL PROCEDURES IN DIAGNOSTIC RADIOLOGY—H. M. Saxton, M.B., M.R.C.P., F.F.R., D.M.R.D., Consultant Radiologist. Guy's Hospital, London; and Basil Strickland, M.B., M.R.C.P., D.C.H., F.F.R., D.M.R.D., Consultant Radiologist, Westminster Hospital, London, and Consultant Radiologist, Brompton Hospital, London. Grune & Stratton, New York, 1964. 275 pages, $8.75.

PRINCIPLES OF BACTERIOLOGY AND IMMUNITY (Topley and Wilson's)—Fifth Edition in Two Volumes, Volume I and II—Sir Graham S. Wilson, M.D., LL.D., F.R.C.P., D.P.H., formerly Director of Public Health Laboratory Service, England and Wales; and A. A. Miles, C.B.E., M.D., F.R.C.P., F.R.S., Professor of Experimental Pathology, University of London, and Director of the Lister Institute of Preventive Medicine, London. With the help of R. Knox, M.D., F.R.C.P.; A. D. Macrae, M.D., Dip. Bact.; M. T. Parker, M.D., Dip. Bact.; G. G. Meynell, M.D.; and Elinor W. Meynell, M.B., B.Ch., B.A.O., Dip. Bact. The Williams & Wilkins Company, Baltimore, Md., exclusive U.S. agents, 1964. Volume I—1191 pages, plus index of 53 pages; and Volume II—1370 pages, plus index of 53 pages; $35.00 for both volumes.

PSYCHIATRIC CARE—Psychiatry Simplified for Therapeutic Action—Jurgen Ruesch, M.D., Carroll M. Brodsky, Ph.D., M.D., and Ames Fischer, M.D. Grune & Stratton, Inc., 381 Park Avenue South, New York 16, N.Y., 1964. 238 pages, $8.75.

REPORT OF THE COMMISSION ON DRUG SAFETY—Commission on Drug Safety; (founded by the Pharmaceutical Manufacturers Association)—L. T. Coggeshall, M.D., Chairman. Federation of American Societies for Experimental Biology, 9650 Wisconsin Avenue, N.W., Washington, D.C. 20014. 228 pages.

SIGNS AND SYMPTOMS—Applied Pathologic Physiology and Clinical Interpretation—Fourth Edition—Edited by Cyril Mitchell MacBryde, A.B., M.D., F.A.C.P., Associate Professor of Clinical Medicine, Washington University School of Medicine; Assistant Physician, The Barnes Hospital; Director, Metabolism and Endocrine Clinics, Washington University Clinics, St. Louis, Missouri. J. B. Lippincott Company, Philadelphia and Montreal, 1964. 971 pages, $14.00.

SYNOPSIS OF PATHOLOGY—Sixth Edition—Edited by W. A. D. Anderson, M.A., M.D., F.A.C.P., F.C.A.P., Professor of Pathology, University of Miami School of Medicine, Coral Gables, Florida; Director of Pathology Laboratories, Jackson Memorial Hospital, Miami, Florida. The C. V. Mosby Company, Saint Louis, 1964. 883 pages, $9.75.

TEXTBOOK OF PEDIATRICS—8th Edition—Edited by Waldo E. Nelson, M.D., D.Sc., Professor of Pediatrics, Temple University School of Medicine and Woman's Medical College of Pennsylvania; With the Collaboration of Eighty-five Contributors. W. B. Saunders Company, Philadelphia, 1964. 1636 pages, $18.00.

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1. Weiner, L. J. and Bockman, A. A.: A Physician's Dilemma: The Acutely Agitated Alcoholic, Scientific Exhibit, A.M.A. Ann. Meet., New York City, June 26-30, 1961.
2. Greenhouse, H. R.: Med. Times 91:1069, Nov., 1963.

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Water Pollution, Sanitation Top Rural Health Problem

Water pollution and sanitation rank as the number one rural health problem, is the finding in a survey of health educators and home economics leaders in 44 State Cooperative Extension Services.

The survey was conducted by the American Medical Association Council on Rural Health to serve as a guide for future programs.

The survey indicated that assurance of an ample supply of uncontaminated water for family and farm use is an increasing problem not only in rural fringe areas near suburban developments but in the more remote farm areas as well.

"Even though mushrooming suburban developments extending into rural areas have posed other serious menaces to public health, this problem seemed most acute," Bond L. Bible, Ph.D., rural sociologist and secretary of the AMA council, said. "Unless proper provisions are made, lack of adequate sewage disposal facilities will almost inevitably lead to serious outbreaks of contagious diseases."

Planning and zoning are needed to solve the problems that arise in land use, he added.

The second most urgent problem, highlighted by the survey, is the need for health education.

Education leads to the use of modern methods of disease prevention, sanitation and health care, including the intelligent utilization of medical services and products.

The Cooperative Extension Service in agriculture and home economics (a part of the Land-Grant University system in each state) provides these educational services. The survey results show that extension service personnel are making effective use of available health resources. They are utilizing the help of state and county health departments, state and county medical societies, and women's auxiliaries to medical societies, local physicians, nurses, and dentists. They also are actively cooperating with voluntary health agencies, farm organizations and other related groups.

Despite these efforts, however, programs to relieve acute rural problems have not yet been universally adopted.

Other important problems on the basis of the survey include:

—Cooperative community action in coordination, development and use of health facilities
—Nutrition, including teenage nutrition; and obesity
—Mental health
—Availability of health personnel
—Health care of the aged
—Dental care
—Teenage health
—Rural safety
—Hospital needs
—Animal diseases affecting man

Weak Staph Can Block Virulent Strains

Nasal inoculations of weak Staphylococcus aureus can prevent the subsequent acquisition of virulent infection-producing strains of this bacterium, a study among volunteers at the Federal Penitentiary in Atlanta showed today.

The findings indicate that this protective interference, previously observed in studies among newborns, might be used to prevent staph infections in households and hospitals, according to a report in the September *American Journal of Diseases of Children*, published by the American Medical Association.

Virulent strains of staph are found among other normal bacteria carried nasally by certain persons who represent a potential hazard to their environment, their contacts and to themselves, it was pointed out. At present, there is no known method which permanently eradicates virulent staph strains from all persistent carriers.

There were 122 persistent staph carriers and 212 persistent noncarriers included in the study reported by Drs. Marvin Boris, New York City, Thomas F. Sellers Jr., Atlanta, Heinz F. Eichenwald, Dallas, John C. Ribble, New York City, and Henry R. Shinefield, New York City.

Some carriers were given antibiotics which temporarily removed nasal bacteria, then inoculated with the weak staph strain, and finally challenged with the virulent strain, while other groups of carriers and noncarriers were used for comparison purposes.

The ability to colonize persistent noncarriers with the weak strain was significantly less than the ability to colonize carriers pretreated successfully with antibiotics, the researchers said.

Antibiotic therapy as employed in this study only resulted in a transient suppression of S aureus, according to the report. When drug therapy was not immediately followed by inoculation with the weak staph strain, the authors commented, the original S aureus strain reappeared in most subjects. Conversely, they added, the original strain was recovered only rarely when there was successful implantation of the weak strain following the antibiotic regimen.

The study provides "direct evidence" that nasal colonization of a weak staph strain interferes with the subsequent colonization of an infection-causing strain, the authors concluded.

The results also indicate that the technique is feasible among this particular population group, they continued. However, they said, conditions in a normal household or hospital obviously differ from a penitentiary and the use of this technique to

(Continued on Page 52)

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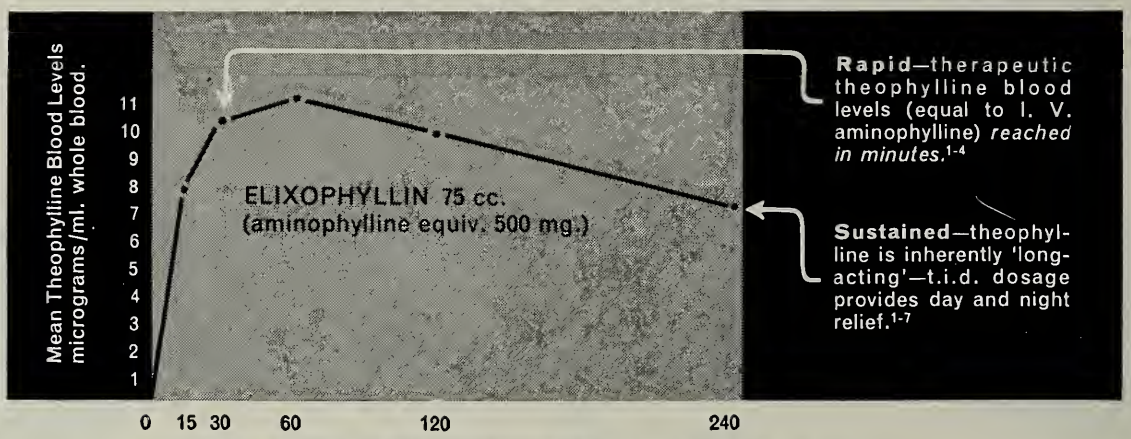
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References: (1) Kessler, F.: Connecticut S.M.J. *21*:205 (March) 1957. (2) Burbank, B.; Schluger, J., and McGinn, J.: Am. J. Med. Sci. *234*:28 (July) 1957. (3) Spielman, A.D.. Ann. Allergy *15*:270 (June) 1957. (4) Greenbaum, J.: Ann. Allergy *16*:312 (May-June) 1958. (5) Kessler, F.: Medical Times *87*:1298 (Oct.) 1959. (6) Bickerman, H.A., and Barach, A. L., in Modell, W.: Drugs of Choice 1960-1961, St. Louis, The C. V. Mosby Company, 1960, p. 516. (7) Wilhelm, R. E. in Conn., H. F.: Current Therapy—1961, Philadelphia, W. B. Saunders Company, p. 417. (8) Schluger, J. McGinn, J. T., and Hennessy, D. J.: Am. J. Med. Sci. *233*:296, 1957.

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Weak Staph Can Block Virulent Strains

(Continued from Page 49)

control staph disease among individuals, families or hospital personnel must await additional controlled observations.

Dr. Shinefield, associate professor, department of pediatrics, The New York Hospital-Cornell Medical Center, has been involved in earlier studies of bacterial interference. Last year he and his associates reported on the use of this phenomenon to protect newborns in hospitals from epidemic staph infections.

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Pneumatic Drill Implicated In Raynaud Disease

Vibration caused by the use of a pneumatic drill may be the primary cause of disabling numbness of the fingers seen among miners, medical researchers reported recently.

The condition, termed Raynaud disease, is brought on by exposure to cold. The arteries of the fingers contract and they become white and numb with the sensation of tingling and tightness.

A study of mine workers from Saskatchewan in northern Canada supports the theory that the primary offender is hand vibration while the secondary offender is cold, Drs. William F. Ashe, Columbus, Ohio, and N. Williams, Regina, Sask., Canada, wrote in the recent *Archives of Environmental Health*, published by the American Medical Association.

Raynaud's phenomenon of occupational origin in hard-rock drillers apparently is "a gross exaggeration of normal constrictive vascular responses brought on by prolonged exposure to violent mechanical vibration," they concluded.

The study also showed that attacks are precipitated by cooling of the entire body rather than cooling of the hands alone, they added.

The conclusions were based on observations of seven Canadian miners compared with three medical students without mining experience under experimental conditions at University Hospital in Columbus.

An analysis of 42 cases of Raynaud disease among Canadian miners indicates that there are four contributing factors—operation of pneumatic tools of relatively high frequency and large amplitude; holding the tool with the hands; a cold, wet environment, and long continuous exposure to this environment, the researchers added.

Raynaud disease has not been observed in other underground employees of these mines who do not operate pneumatic drills but who work under otherwise similar conditions, they pointed out.

There is no known treatment that is effective for Raynaud disease, according to the authors.

In discussing preventive measures, they said, heating a mine is an economic impossibility unless large amounts of waste heat are available. However, replacement of currently used drills with a type that is not hand held is a possibility which is being investigated.

The physicians recommended an education program for employer and employee to reduce the incidence of the disorder. For example, they said, miners can be trained not to "ride" the drill and not to hold it more than is necessary for efficiency and safety.

Dr. Ashe is affiliated with the department of preventive medicine, Ohio State University College of Medicine. Dr. Williams is with the Department of Public Health, Province of Saskatchewan.



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†25% of the Recommended Daily Adult Dietary Allowance of Protein (70 grams) as established by the National Research Council.

REFERENCES AND REVIEWS

Plagiarism and Identification—J. A. M. Meerloo (300 Central Park West, New York), Arch. Gen. Psychiat., 11:421 (Oct.) 1964.

The various ways unwitting plagiarism can occur are discussed. The very word is a form of unobtruse plagiarism. Two cases of unconscious, more elaborate plagiarism are described. Plagiarism can be an act of conscious deceit, but there also is an inadvertent kind, dependent on the normal processes of communication, learning, and human interaction.

* * *

Socio-Economic Aspects of the Pneumoconioses—V. M. Trasko (300 Independence Ave. SW., Washington, D.C.), Ach. Environ. Health, 9:521 (Oct.) 1964.

The consequences of early uncontrolled dust exposures are revealed today in high social benefits paid out for pneumoconioses. Some 27,000 claims for pneumoconioses, amounting to 132 million dollars, have been settled by workmen's compensation agencies in 18 states since 1950. The Social Security Administration estimates that 15,000 workers under 65 years of age are in current payment status for disability due to pneumoconioses, and that they and their dependents are receiving $18 million a year in benefits. The trend experience for four states covering 17 to 25 years data illustrates the mounting costs of the disease. Socio-economic implications of the disease since the depression years of the 1930's are briefly reviewed.

* * *

The Neuronal Density of the Diencephalic Gray Nuclei—R. Bauchot (Laboratoire d'Anatomie Comparee, Centre de'Orsay, Orsay, France), J. Hirnforsch, 6:327-330 (No. 5) 1964.

The neuronal density of the diencephalic gray nuclei is inversely proportional to the size of the brain, or rather to the size of the body of the species. The coefficient of regression in relation to body size is of the order of –0.50. The total number of neurones in a diencephalic nucleus increases very slowly with the body size. Finally, it is found that the gray nuclei with a high cellular density generally contain small neurones, and, inversely, that the gray nuclei with a lower cellular density contain larger neurones.

* * *

Ocular Electromyography in Brain Stem Dysfunction—R. N. Reuben and C. Gonzales (550 First Ave., New York). Arch. Neurol., 11:265 (Sept.) 1964.

A case of brain stem dysfunction with multiple oculomotor abnormalities is described. Electromyography of the eye muscles revealed abnormal patterns of inhibition, excitation, and tonic activity not suspected by clinical inspection. These findings suggest that pathways mediating excitation and inhibition of the oculomotor and abducens nuclei may be affected separately by a brain stem lesion.

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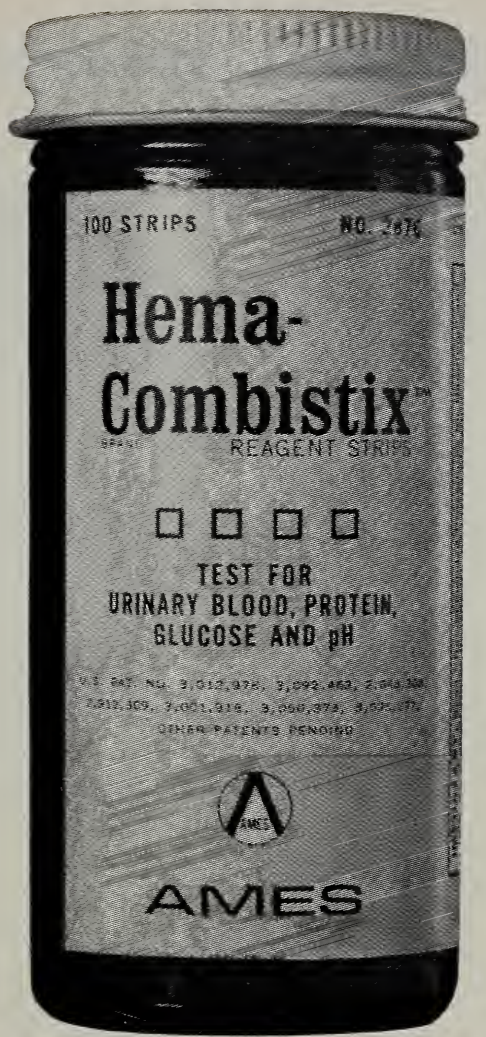
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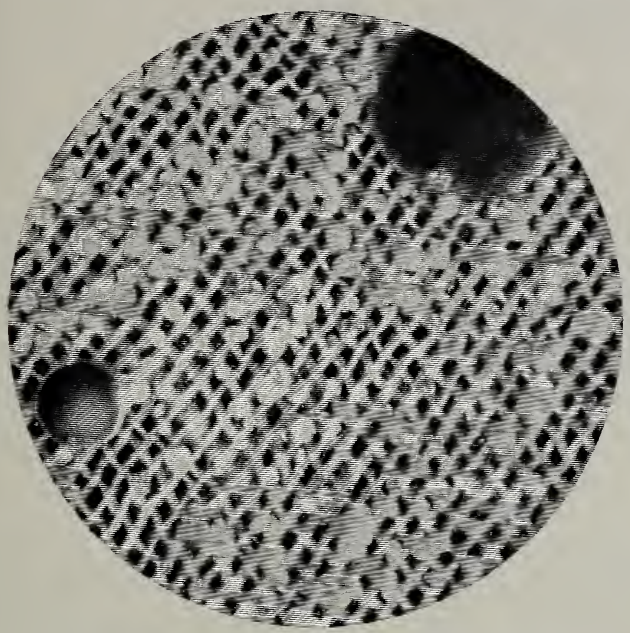
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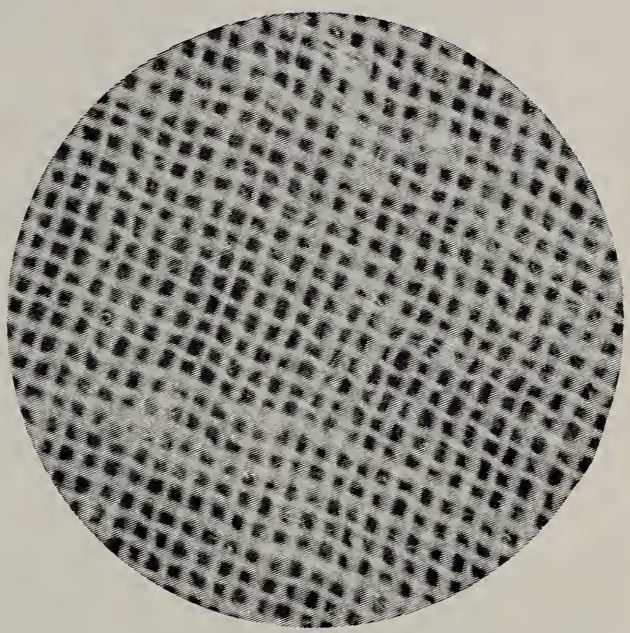
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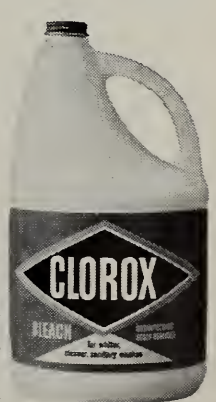
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Committee on Private Practice of Medicine by Medical Schools Faculty Members

Frank J. Novak, San Mateo.....1965
Victor Kovner, Los Angeles.....1965
Bert L. Halter, San Francisco (Chmn.).....1966
Samuel R. Irvine, Beverly Hills.....1967
Francis E. West, San Diego.....1967

BUREAU OF *Research and Planning*

James R. Powell, Stockton (Secy.).....1965
T. Eric Reynolds, Oakland.....1965
Gerald W. Shaw, Santa Monica.....1965
Franklin F. Ham, Van Nuys.....1966
John T. Saidy, San Mateo.....1966
John J. Sheehy, Riverside.....1967
H. Russell Fisher, Glendale.....1967
Samuel R. Sherman, San Francisco (Chmn.).....1967
EX-OFFICIO:
James C. Doyle, Beverly Hills
Ralph C. Teall, Sacramento
Carl E. Anderson, Santa Rosa

Judicial COMMISSION

Floyd O. Due, Oakland.....1965
Sidney J. Shipman, San Francisco.....1965
Francis E. West, San Diego.....1965
Douglas G. Campbell, San Francisco.....1966
W. Philip Corr, Riverside (Secy.).....1966
L. E. Wilson, Anaheim.....1966
Donald A. Charnock, Los Angeles (Chm.).....1967
Albert E. Long, San Francisco.....1967
Donald Cass, Los Angeles.....1967

Scientific Board

Lewis T. Bullock, Los Angeles.....1965
Albert C. Daniels, San Francisco.....1965
Knox H. Finley, San Francisco.....1965
Walter E. Heck, San Francisco.....1965
Herbert A. Holden, San Leandro.....1965
Edmund L. Keeney, La Jolla.....1965
Stuart C. Knox, Hollywood.....1965
William P. Longmire, Jr., Los Angeles.....1965
J. G. Moore, Los Angeles.....1965
Telfer B. Reynolds, Los Angeles.....1965
Saul J. Robinson, San Francisco.....1965
John B. deC. M. Saunders, San Francisco.....1965
David A. Wood, San Francisco.....1965
Grace B. Bell, Los Angeles.....1966
Gerson R. Biskind, San Francisco.....1966
Leland B. Blanchard, San Jose.....1966
Eugene M. Farber, Palo Alto.....1966
A. J. Franzi, San Francisco.....1966
L. S. Goerke, Los Angeles.....1966
George C. Griffith, Los Angeles.....1966
Joseph J. Kaufman, Los Angeles.....1966
Alonzo J. Neufeld, Los Angeles.....1966
Donald W. Petit, Pasadena.....1966
Paul C. Samson, Oakland.....1966
Edward B. Shaw, San Francisco (Chmn.).....1966
Malcolm S. M. Watts, San Francisco.....1966
William W. Belford, San Diego.....1967
Jerome W. Bettman, San Francisco.....1967
John B. Dillon, Los Angeles.....1967
Justin J. Stein, Los Angeles.....1967
Charles E. Grayson, Sacramento.....1967
R. Kirklin Ashley, San Francisco.....1967
Clayton G. Loosli, Los Angeles.....1967
Victor Richards, San Francisco.....1967
David Rubin, Los Angeles.....1967
Keith P. Russell, Los Angeles.....1967
Edward J. Zaik, Los Angeles.....1967
EX-OFFICIO:
Dwight L. Wilbur, San Francisco

Executive Committee

Lewis T. Bullock, Los Angeles.....1965
Edward B. Shaw, San Francisco (Chmn.).....1966
George C. Griffith, Los Angeles.....1966
Malcolm S. M. Watts, San Francisco.....1966
William W. Belford, San Diego.....1967
Clayton G. Loosli, Los Angeles.....1967
Victor Richards, San Francisco.....1967
Justin J. Stein, Los Angeles.....1967
CONSULTANT:
Albert C. Daniels, San Francisco
EX-OFFICIO:
Dwight L. Wilbur, San Francisco

Committee on Scientific Assemblies

William P. Longmire, Jr., Los Angeles.....1965
J. G. Moore, Los Angeles.....1965
Telfer B. Reynolds, Los Angeles.....1965
J. B. deC. M. Saunders, San Francisco.....1965
George C. Griffith, Los Angeles.....1966
John B. Dillon, Los Angeles.....1967
Victor Richards, San Francisco (Chmn.).....1967
CONSULTANT:
Albert C. Daniels, San Francisco

Committee on CALIFORNIA MEDICINE

Grace B. Bell, Los Angeles.....1966
Eugene M. Farber, Palo Alto.....1966
Clayton G. Loosli, Los Angeles (Chmn.).....1967
David Rubin, Los Angeles.....1967
R. Kirklin Ashley, San Francisco.....1967

Committee on Nominations

William P. Longmire, Jr., Los Angeles.....1965
Malcolm S. M. Watts, San Francisco (Chmn.).....1966
William W. Belford, San Diego.....1967

Committee on Continuing Medical Education

George C. Griffith, Los Angeles (Chmn.).....1965
A. J. Franzi, San Francisco.....1966
Alonzo J. Neufeld, Los Angeles.....1966
Donald W. Petit, Pasadena.....1966
Victor Richards, San Francisco.....1967
CONSULTANT:
Albert C. Daniels, San Francisco

Committee on Scientific Information

Edmund L. Keeney, La Jolla.....1965
Stuart C. Knox, Hollywood.....1965
Gerson R. Biskind, San Francisco.....1966
L. S. Goerke, Los Angeles.....1966
Justin J. Stein, Los Angeles (Chmn.).....1967
CONSULTANT:
Edward J. Zaik, Los Angeles

Committee on Maternal and Child Care

Charles M. Blumenfeld, Sacramento.....1965
Herbert A. Holden, San Leandro.....1965
Saul J. Robinson, San Francisco.....1965
Leland B. Blanchard, San Jose.....1966
James W. Ravenscroft, San Diego.....1966
Russell W. Mapes, Beverly Hills.....1967
Keith P. Russell, Los Angeles (Chmn.).....1967
Forrest H. Howard, Garden Grove.....1967

Committee on Cancer

Sol R. Baker, Beverly Hills.....1965
John G. Walsh, Sacramento.....1965
David A. Wood, San Francisco (Chmn.).....1965
Burt L. Davis, Palo Alto.....1966
Paul C. Samson, Oakland.....1966
John W. Cline, San Francisco.....1967

SUB-COMMITTEES, COMMITTEE ON CANCER:

Committee on Cancer Education

Sol R. Baker, Beverly Hills (Chmn.).....1965
Paul H. Deeb, Loma Linda.....1965
Robert W. Jamplis, Palo Alto.....1965
Maurice Galante, San Francisco.....1965
Justin J. Stein, Los Angeles.....1965

Committee on Tumor Tissue Registry

E. M. Butt, Los Angeles.....1965
John W. Cline, San Francisco (Chmn.).....1965
Lewis M. Guiss, Los Angeles.....1965
James E. Kahler, Los Angeles.....1965
Carl M. McCandless, San Francisco.....1965

Committee on Consultative Tumor Boards

Bert L. Halter, San Francisco.....1965
Carl L. Moore, Bakersfield.....1965
Otto Pflueger, San Francisco.....1965
Victor Richards, San Francisco.....1965

Committee on New and Unproved Methods of Cancer Treatment

Dexter T. Ball, Santa Ana.....1965
L. Henry Garland, San Francisco.....1965
Paul C. Samson, Oakland (Chmn.).....1965
Ray Seavers, Jr., San Bernardino.....1965
Jerome A. Weinbaum, Chico.....1965
CONSULTANT:
Kenneth F. Ernst, Berkeley
(Cancer Adv. Council)

Finance COMMITTEE

John Murray, Fresno (Chmn.)
Malcolm C. Todd, Long Beach
Joseph P. Cosentino, Sacramento
Albert G. Miller, San Mateo
Harold Kay, Oakland

COMMITTEE ON *Legislation*

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John Morrison, San Leandro

Special COMMITTEES

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Members who contemplate presentation of scientific papers should promptly address the secretary of the proper section at the address shown below.

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Leo R. Melcher.....Chairman
150 Arch Street, Redwood City 94062
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3616 Main Street, Riverside 92501
Leo N. Meleyco.....Secretary
2040 Forest Avenue, San Jose 95128

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686 East Union Street, Pasadena 91101

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8618 Sepulveda Boulevard, Los Angeles 90045

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15225 Van Owen, Van Nuys 91405

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Leland B. Blanchard.....Vice-Chairman
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408 Cassidy Street, Oceanside 92054

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David B. Sheldon.....Vice-Chairman
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T. Newlin Hastings.....Secretary
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Rufus J. Walker.....Vice-Chairman
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384 Post Street, San Francisco 94108

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Karl L. Schaupp, Jr.....Vice-Chairman
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Lester T. Hibbard.....Secretary
1930 Wilshire Boulevard, Room 607,
Los Angeles 90057

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San Francisco 94110
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Santa Clara County Hospital,
South Bascom Avenue, San Jose 95128

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36 North San Mateo Drive, San Mateo 94401
Jack W. Bills.....Vice-Chairman
14914 Sherman Way, Van Nuys 91405
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636 Harris Street, Eureka 95501

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L. Leonard Huddleston.....Chairman
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Gregory Bard.....Vice-Chairman
U.C. Medical Center, San Francisco 94122
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4900 Sunset Boulevard, Los Angeles 90027

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100 North Garfield Avenue, Pasadena 91101
Byron O. Mork.....Vice-Chairman
217 West First Street, Los Angeles 90012
Henrik L. Blum.....Secretary
P.O. Box 871, Martinez 94554

Psychiatry and Neurology

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910 Via de la Paz, Pacific Palisades 90272
George Y. Abe.....Vice-Chairman
Metropolitan State Hospital, Norwalk 90650
Werner M. Mendel.....Secretary
1934 Hospital Place, Los Angeles 90033

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John L. Gwinn.....Chairman
Children's Hospital, 4614 Sunset Boulevard,
Los Angeles 90027
John C. Bennett.....Vice-Chairman
St. Mary's Hospital, 2200 Hayes Street,
San Francisco 94117
Victor G. Mikity.....Secretary
1200 North State Street, Los Angeles 90033

Urology

Michael J. Feeney.....Chairman
3415 Sixth Avenue, San Diego 92103
Carl Burkland.....Vice-Chairman
5301 F Street, Sacramento 95819
Carl K. Pearlman.....Secretary
1518 North Sycamore, Santa Ana 92701

Delegates and Alternates

TO THE AMERICAN MEDICAL ASSOCIATION

DELEGATES		ALTERNATES
Leopold H. Fraser, Richmond	(1963-1964)	Hartzell H. Ray, San Mateo
Arthur A. Kirchner, Los Angeles	(1963-1964)	Dudley M. Cobb, Los Angeles
Dwight L. Wilbur, San Francisco	(1963-1964)	Francis J. Cox, San Francisco
J. Norman O'Neill, Los Angeles	(1963-1964)	William F. Quinn, Los Angeles
J. Lafe Ludwig, Los Angeles	(1963-1964)	Harold Kay, Oakland
Burt L. Davis, Palo Alto	(1963-1964)	Leon P. Fox, San Jose
Arlo A. Morrison, Ventura	(1963-1964)	John G. Morrison, San Leandro
James E. Feldmayer, Exeter	(1963-1964)	Charles Grayson, Sacramento
O. W. Wheeler, Riverside	(1963-1964)	Wilbur Bailey, Los Angeles
Malcolm C. Todd, Long Beach	(1963-1964)	Alfred J. Murrieta, Jr., Los Angeles
J. E. Vaughan, Bakersfield	(1963-1964)	Joseph P. O'Connor, Pasadena
Samuel R. Sherman, San Francisco	(1964-1965)	Albert G. Miller, San Mateo
Henry Gibbons, III, San Francisco	(1964-1965)	Robert Combs, San Francisco
John M. Rumsey, San Diego	(1964-1965)	Francis E. West, San Diego
Eugene F. Hoffman, Los Angeles	(1964-1965)	Edward H. Crane, Jr., Inglewood
Warren L. Bostick, Los Angeles	(1964-1965)	Walter H. Brignoli, St. Helena
J. B. Price, Santa Ana	(1964-1965)	Donald C. Dodds, Oakland
Ralph C. Teall, Sacramento	(1964-1965)	Robb Smith, Orange Cove
James C. Doyle, Beverly Hills	(1964-1965)	Homer C. Pheasant, Los Angeles
Wilbur G. Rogers, Glendale	(1964-1965)	Carl M. Hadley, San Bernardino
Charles B. Hudson, Oakland	(1964-1965)	Robert L. Watson, Jr., Los Angeles

(Delegates and Alternates to the A. M. A. are elected for terms of two calendar years. Each office is scheduled for election at the Annual Session of the second year shown above.)

Other Organizations and Medical Schools

Board of Medical Examiners of the State of California

Secretary.....Raymond M. Wallerius
1021 O Street, Room A547, Sacramento 95814
San Francisco.....455 Golden Gate Ave.
Room 4184 94102
Los Angeles.....107 South Broadway 90012
Sacramento....1021 O Street, Room A547 95814

The Public Health League of California

Executive Secretary.....Ben H. Read
955 South Western Ave., Los Angeles 90006
Associate Executive Secretary.....E. E. Salisbury
693 Sutter Street, San Francisco 94102
San Francisco.....693 Sutter Street 94102
415 474-1061
Los Angeles.....955 South Western Ave. 90006
213 731-6397

Department of Public Health of the State of California

Director.....Malcolm H. Merrill, M.D.
2151 Berkeley Way, Berkeley 94704
Berkeley.....2151 Berkeley Way 94704
415 843-7900
Sacramento.....631 J Street 95814
916 442-4711
Los Angeles.....703 State Building 90012
213 620-2900

Medical Schools in California

University of California School of Medicine, Medical Center, San Francisco 94122. Dean: William O. Reinhardt, M.D.

Stanford University School of Medicine, 300 Pasteur Drive, Palo Alto 94304. Acting Dean: Sidney Raffel, M.D.

University of Southern California School of Medicine, 2025 Zonal Avenue, Los Angeles 90033. Dean: Roger O. Egeberg, M.D.

Loma Linda University, School of Medicine, 1720 Brooklyn Avenue, Los Angeles 90033. Dean: David Burdg Hinshaw, M.D.

University of California at Los Angeles, School of Medicine, Hilgard Avenue, Los Angeles 90024. Dean: Sherman M. Mellinkoff, M.D.

California College of Medicine: 1721 Griffin Avenue, Los Angeles 90031. Dean: Warren L. Bostick, M.D.

Roster — CALIFORNIA COMPONENT MEDICAL SOCIETIES

Society secretaries are requested to notify California Medicine promptly when changes are indicated in their roster information

ALAMEDA-CONTRA COSTA Medical Assn., 6230 Claremont Ave., Oakland 94618. Meets quarterly.
Carl Goetsch.....President
2915 Telegraph Ave., Berkeley 94705
Frederick W. Ackerman.....Secretary
6230 Claremont Ave., Oakland 94618

BUTTE-GLENN Medical Society, P. O. Box 1008, Chico 95927. Meets Fourth Thursday.
Jay O. Gibson.....President
170 E. 2nd Ave., Chico 95926
Dale W. Ritter.....Secretary
6 Cohasset Circle, Chico 95926

FORTY FIRST Medical Society, 4775 Santa Monica Blvd., Los Angeles 90029.
Loron N. McGillis.....President
11230 Magnolia Blvd., No. Hollywood 91601
Glenn F. Gordon.....Secretary
1630 Del Valle Ave., Glendale 91208

FRESNO County Medical Society, 2155 Amador, Fresno 93721. Meets Second Tuesday, 6:30 p.m., Sunnyside Country Club.
Norman E. Tostenson.....President
1223 Wishon Ave., Fresno 93728
Joseph B. Ford, Jr. Secretary
2940 Fresno St., Fresno 93721

HUMBOLDT-DEL NORTE County Medical Society. Meets Second Thursday.
Robert Devine.....President
730 7th St., Eureka 95501
Wells Carey.....Secretary
2822 E St., Eureka 95501

IMPERIAL County Medical Society. Meets Second Tuesday, 8 p.m., Pioneer Memorial Hospital, Brawley.
Nathan Wolf.....President
126 Main St., Brawley 92227
Ernest Brock Secretary
200 S. Imperial Ave., Imperial 92251

INYO-MONO County Medical Society. Meets Fourth Tuesday except December, January, February.
D. L. Christenson.....President
380 N. Mt. Whitney Dr., Lone Pine 93545
W. Ray Hartwig.....Secretary
459 West Line, Bishop 93514

KERN County Medical Society, 2603 G Street, Bakersfield 93301. Meets Third Tuesday, 7:30 p.m., Society Office, 2603 G Street, except June, July, August.
Hans E. Einstein.....President
2441 "G" St., Bakersfield 93301
Keith W. Spaulding.....Secretary
2521 "G" St., Bakersfield 93301

KINGS County Medical Society. Meets Second Thursday, 7:00 p.m. Place to be announced.
Clyde Ball.....President
1320 Whitley Ave., Corcoran 93212
Edwin E. Kerr.....Secretary
208 N. Douty St., Hanford 93230

LASSEN-PLUMAS-MODOC-SIERRA County Medical Society. Meets on call.
Lloyd Shannon.....President
P. O. Box 963, Alturas 96101
Robert C. Haggard.....Secretary
Box 426, Loyalton 96118

LOS ANGELES County Medical Assn., 1925 Wilshire Blvd., Los Angeles 90057.
Elmer F. Gooel.....President
1925 Wilshire Blvd., Los Angeles 90057
George C. Andersen.....Secretary
1925 Wilshire Blvd., Los Angeles 90057

MARIN Medical Society, 1601 Second St., Suite 106, San Rafael 94901. Meets First Thursday, 7:00 p.m.
Calvin Plumhof.....President
711 D St., San Rafael 94901
John McGee Secretary
712 D St., San Rafael 94901

MENDOCINO-LAKE County Medical Society.
Thomas Nicholson.....President
408 W. Perkins St., Ukiah 95482
Patrick R. Allanson.....Secretary
728 S. State St., Ukiah 95482

MERCED County Medical Society. Meets Fourth Thursday, Hotel Tioga, Merced.
James A. Parker.....President
535 W. 26th St., Merced 95340
Patrick J. Maloney.....Secretary
656 W. 20th St., Merced 95340

MONTEREY County Medical Society, P. O. Box 308, Salinas 93903. Meets First Thursday.
Osman H. Hull.....President
716 Cass St., Monterey 93940
Joseph E. Turner.....Secretary
1073 Cass St., Monterey 93940

NAPA County Medical Society. Meets Second Wednesday, P. O. Box 658, Napa 94559
E. Paul White, Jr. President
P. O. Box 658, Napa 94559
Richard Clark.....Secretary
1054 Beard Rd., Napa 94558

ORANGE County Medical Association, 300 S. Flower, Orange 92666. Meets First Tuesday, 7:00 p.m.
Hugh J. Plumb, Jr. President
1901 Westcliff Dr., Newport Beach 92663
Laurance A. Mosier.....Secretary
10510 Chapman St., Garden Grove 92640

PLACER-NEVADA County Medical Society. Meets Second Wednesday.
Clifford W. Wauters.....President
701 High St., Auburn 95603
Arthur R. Weaver.....Secretary
701 High St., Auburn 95603

RIVERSIDE County Medical Association, 4175 Brockton Ave., Riverside 92501. Meets Second Monday, 7:30 p.m., Spanish Arts Gallery, Mission Inn.
Donald P. Carpenter.....President
3660 Arlington Ave., Riverside 92506
Richard W. Trotter.....Secretary
6876 Magnolia Ave., Riverside 92506

SACRAMENTO Society for Medical Improvement, 5380 Elvas Ave., Sacramento 95819. Meets Third Tuesday, 8:30 p.m., Sutter Hospital Auditorium.
L. Morgan Boyers.....President
2615 Eye St., Sacramento 95816
James W. Martin.....Secretary
2811 L Street, Sacramento 95816

SAN BENITO County Medical Society. Meets once a month, except July and August. Time and place to be announced.
Kent S. Taylor.....President
345 5th St., Hollister 95023
Robert D. Quinn.....Secretary
535 Monterey St., Hollister 95023

SAN BERNARDINO County Medical Society, 1875 N. D St., San Bernardino 92405. Meets First Tuesday, 7:30 p.m., Harold's Club, Fontana.
Merlin A. Hendrickson.....President
238 N. Riverside Ave., Rialto 92376
Nicholas P. Krikes.....Secretary
25060 Base Line, San Bernardino 92410

SAN DIEGO County Medical Society, 3427 - 4th Ave., San Diego 92103. Meets Second Tuesday. Location of meetings varies.
John W. Flaiz.....President
3427 4th Ave., San Diego 92103
W. C. Herrick.....Secretary
233 A St., San Diego 92101

SAN FRANCISCO Medical Society, 250 Masonic Ave., San Francisco 94118.
Edgar Wayburn.....President
490 Post St., San Francisco 94102
Nicholas D. Bonfilio.....Secretary
1548 Stockton St., San Francisco 94133

SAN JOAQUIN County Medical Society. Meets First Thursday, 8:15 p.m., 445 W. Acacia St., P. O. Box 230, Stockton 95201.
David Leon Green, Jr.....President
2633 Pacific Ave., Stockton 95204
Dora A. Lee.....Secretary
2420 N. California St., Stockton 95204

SAN LUIS OBISPO County Medical Society. Meets Third Saturday, 7:00 p.m., Anderson Hotel, San Luis Obispo 93402.
Richard W. Eells.....President
743 Pismo St., San Luis Obispo 93401
Richard W. Cletsoway.....Secretary
705 Grand Ave., San Luis Obispo 93402

SAN MATEO County Medical Society, 122 El Camino Real, San Mateo 94401. Meets Third Tuesday.
Ward L. Hart.....President
100 Laurel Ave., San Carlos 94401
Howard W. Lindsey.....Secretary
323 N. San Mateo Dr., San Mateo 94401

SANTA BARBARA County Medical Society, 300 W. Pueblo St., Santa Barbara 93105. Meets Second Monday of the month, University Club, 1332 Santa Barbara St., Santa Barbara.
H. L. Stewart, Jr.....President
300 W. Pueblo St., Santa Barbara 93105
Thurman K. Hill.....Secretary
300 W. Pueblo St., Santa Barbara 93105

SANTA CLARA County Medical Society, 700 Empey Way, San Jose 95128. Meets First Monday.
S. Fred Kaufman.....President
700 Empey Way, San Jose 95128
Jacob M. Stone.....Secretary
700 Empey Way, San Jose 95128

SANTA CRUZ County Medical Society. Meets every Second Month, Second Tuesday. Time, place to be announced.
F. H. Koepke.....President
850 Main St., Watsonville 95076
John W. Morris.....Secretary
230 Walnut Ave., Santa Cruz 95060

SHASTA-TRINITY County Medical Society. Meets Second Monday of the month. Place to be announced.
Michael J. Hamilton.....President
1348 Market St., Redding 96001
Robert G. Taylor.....Secretary
1308 Court St., Redding 96001

SISKIYOU County Medical Society. Meets Sunday on call.
William D. Schnack.....President
8 Main St., Weed 94096
Rand Apgood.....Secretary
Medical Center Building, Yreka 96097

SOLANO County Medical Society. Meets Second Tuesday, 8:00 p.m., at different meeting places.
Harle B. Grover.....President
839 Louisiana St., Vallejo 94590
Richard D. Frank.....Secretary
1200 Marin St., Vallejo 94590

SONOMA County Medical Society, 576 B Street, Santa Rosa 95401. Meets Second Thursday.
A. A. Thurlow, Jr. President
185 Sotoyome St., Santa Rosa 95405
Tetsuro Fujii.....Secretary
1667 Bloomfield Rd., Sebastopol 95472

STANISLAUS County Medical Society, 303 Downey Ave., Modesto. Meets Third Tuesday of the month, 7 p.m., Hotel Covell, Modesto 95354.
John S. Woolley.....President
808 13th St., Modesto 95354
Jeanne I. Miller.....Secretary
709 - 18th St., Modesto 95354

TEHAMA County Medical Society. Meets at call of President.
Harve Jourdan President
343 Oak St., Red Bluff 96080
William L. Weirich.....Secretary
210 S. Main St., Red Bluff 96080

TULARE County Medical Society, 1640 West Mineral King, P. O. Box 16, Visalia 93278.
James W. Goettle.....President
P.O. Box 120, Tulare 93274
Philip S. Barber.....Secretary
P. O. Box 16, Visalia 93278

VENTURA County Medical Society. Meets Second Tuesday each month, 7:30 p.m., Los Posas Country Club, Camarillo.
Henry J. Rulfo.....President
302 Glen Ellen Dr., Ventura 93003
F. K. Helbling.....Secretary
3081 Loma Vista Rd., Ventura 93003

YOLO County Medical Society. Meets First Wednesday.
Spencer T. Chester.....President
Woodland Clinic, Woodland 95675
Samuel C. Houston.....Secretary
3 Court St., Woodland 95695

YUBA-SUTTER-COLUSA County Medical Society, 370 Del Norte Ave., Yuba City 95991. Meets Second Tuesday.
Robert H. Greeley.....President
725 4th St., Marysville 95901
Norman K. Noordhoff.....Secretary
320 G St., Marysville 95901

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Vice-Chairman of the Board.....Warren L. Bostick
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Assistant Secretary.....Herman H. Stone
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Assistant Treasurer.....Mr. John Cowee

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John E. Vaughan.....Bakersfield
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*Appointed by C.M.A. Council.
†Non-Trustee Members.

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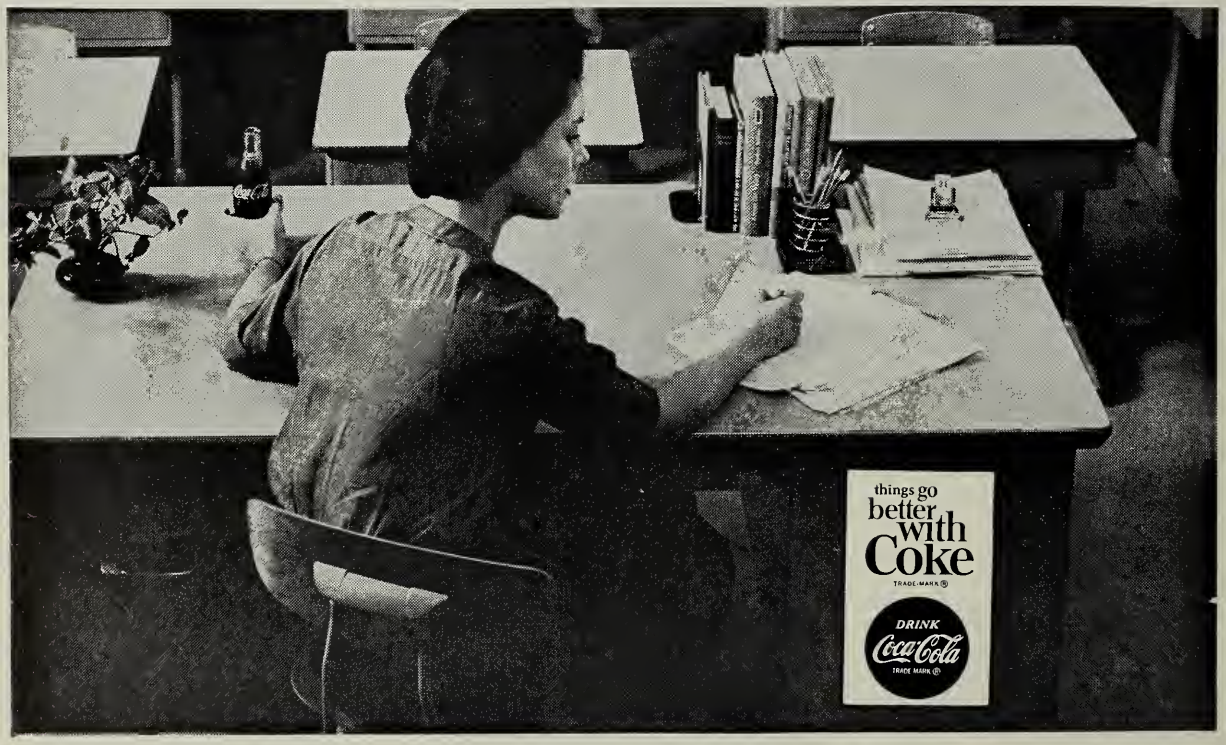
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Artificial Kidney Is Feasible in Home

Home use of the artificial kidney machine today was termed "technically feasible where suitable domestic facilities exist."

In addition to the greater convenience offered the patient, in-the-home treatment also is less costly than when it is performed in an artificial kidney center, according to a report in the November 2 *Journal of the American Medical Association.*

Use of the artificial kidney in the homes of three patients was described by J. P. Merrill, M.D., E. Schupak, M.D., E. Cameron, R.N., and C. L. Hampers, M.D., Boston.

The patients have undergone a total of 30 home hemodialyses, the process of cleansing the blood of waste products, and the results were comparable to those carried out in the hospital, the authors said.

Although the patients were not completely rehabilitated, they were able to work six hours a day between dialyses, it was reported.

Dialyses were performed once a week at home and once a week in the hospital after an initial period of hospitalization during which the patient's condition was stabilized. Home treatment is suitable for ambulatory patients capable of employment but not for the acutely ill, it was pointed out.

One patient had been treated for nine months during which 17 dialyses were performed in the home. The second patient had been treated for four months and undergone 10 home dialyses. The third patient had been treated for three months with three dialyses in the home. Each dialysis, using the twin-coil artificial kidney, lasted four to six hours.

The estimated cost of the twin-coil kidney machine and necessary equipment for home dialysis would be about $2,000, according to the authors. The cost per dialysis would be $85, not including professional fees for the physician, who would check the patient before each dialysis, and for a private duty nurse, who would monitor the procedure.

The cost of maintaining eight patients through use of the artificial kidney has been estimated at $10,000 per patient year at the chronic dialysis center in Seattle, it was pointed out. However, the development and marketing of a single-coil disposable unit for the artificial kidney at one-half the price of the twin-coil would reduce the annual expense to about $5,500, the authors said. This product is expected to be available in the next few months.

To make a program of home dialysis a "practical endeavor" requires improvements, the authors concluded. Nursing personnel must be made available or nonprofessional personnel trained to monitor the procedure, they said, and the coordination of the cost of this kind of care with present medical insurance plans must be attempted.

One way to implement such a program might be a mobile unit, in which two or three patients could be treated at one time and which could move from community to community with a full-time experienced team, the authors suggested.

It is estimated that in the United States, 2,000 patients who annually die of chronic kidney failure might survive with use of the artificial kidney, the authors added.

It has been adequately proven that for some patients with chronic kidney failure in whom conservative treatment is inadequate, useful existence may be maintained for significant periods of time by the use of the artificial kidney, they said.

It is anticipated that this technique will be used to maintain patients until transplantation of a human kidney can be performed, they added.

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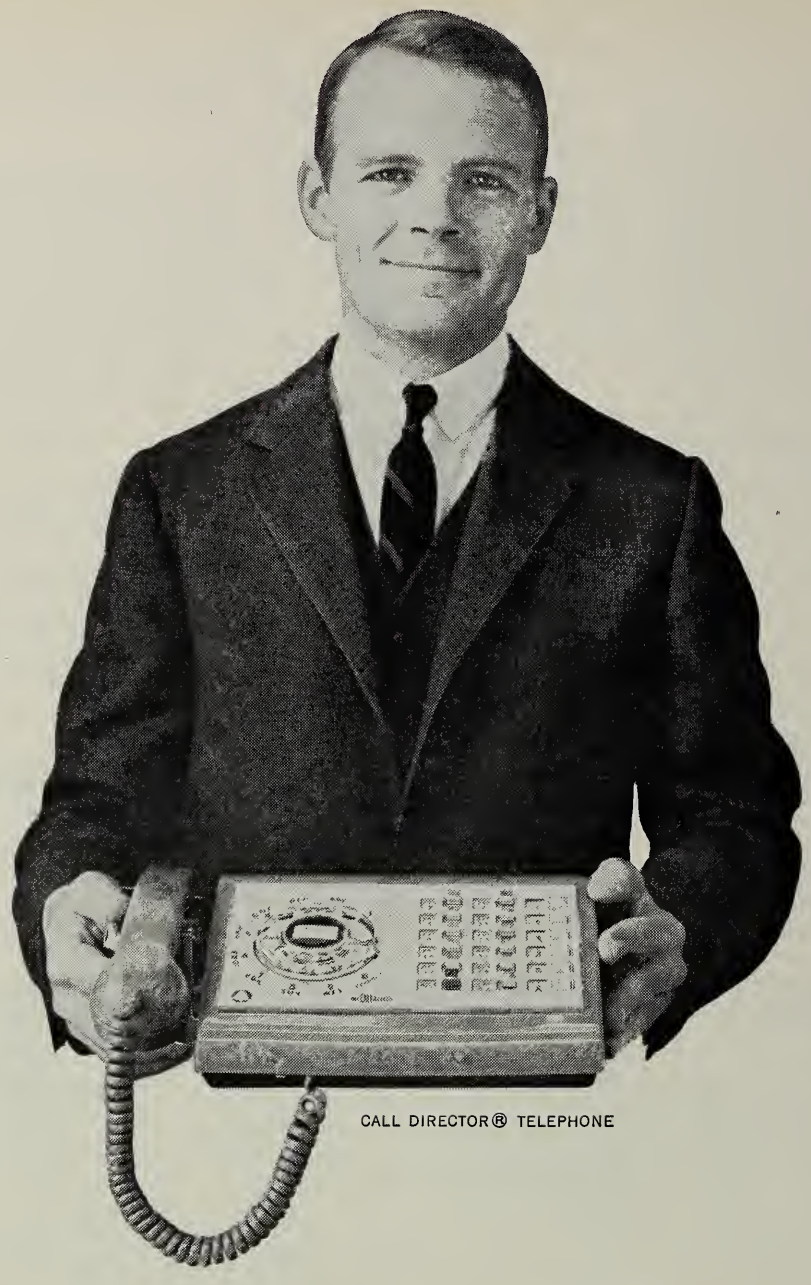
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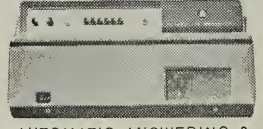


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Study Size of Hospital, Staff In Psychiatric Care

A comparison among 30 Veterans Administration hospitals indicates that psychiatric treatment is more effective in the smaller, more highly-staffed institutions.

The study, reported by Leonard P. Ullmann, Ph.D., Urbana, Ill., and Lee Gurel, Ph.D., Washington, D.C., confirms the general belief that smaller size and higher staff-to-patient ratio are related to higher rates of favorable outcome.

The findings further tend to show that these two factors influence different aspects of treatment and have different areas of impact, the researchers wrote in the October *Archives of General Psychiatry*, published by the American Medical Association.

"Both small size and high staffing were significantly associated with hospital effectiveness," they said.

"Small size was found to be of greater importance in establishing a high rate of early release, while high staffing was found to be of greater importance in obtaining turnover in terms of number of admissions, number of terminated cases, and percentages of patients with long-continued hospitalization.

"The data dealing with size support the trend to build smaller hospitals, or if this is not feasible, to utilize unit system plans.

"The data dealing with the effect of staffing on turnover criteria as distinct from early release may be taken as an indication of the value of increased staffing on continued treatment, chronic, or back wards rather than the current possibly disproportionate emphasis on staffing of acute or admission wards."

VA hospitals are typically smaller and more highly staffed than state mental hospitals, it was pointed out. The size of the 30 hospitals in the study, based on the average daily patient load, ranged from 604 to 2,390 patients with an average of 1,453.

Hospitals were selected which had a high percentage of psychiatric patients. The 7,212 patients studied consisted of every male schizophrenic under 60 years of age admitted during the first year of the two-year study who later established an unequivocal early or late "first significant release."

Effectiveness of hospitalization was based on four criteria—early release, admissions, turnover, and long hospital residence. The four factors were highly correlated, i.e., the more early releases there were, the greater the space available for new patients, the lower the precentage of inpatients with long stay, and the higher the turnover as measured by terminated cases.

(Continued on Page 42)

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BOOKS RECEIVED

Books received by CALIFORNIA MEDICINE *are acknowledged in this column. Selections will be made for more extensive review in the interest of readers as space permits.*

APPLIED HUMAN BIOLOGY FOR NURSES—William C. Fream, S.R.N., B.T.A.Cert.(Hon.), S.T.D., Senior Tutor, Ballarat Base Hospital, Australia; Formerly Senior Tutor, Northern Nigeria and Tutor in sole charge, Highwood Hospital, Brentwood, Essex. Foreword by H. P. Lambert, M.D., M.B., B. Chir., M.R.C.P., Consultant Physician, St. George's Hospital, London. The Williams and Wilkins Company, Baltimore, Md., 1964. 408 pages, $5.75.

BAHAMA INTERNATIONAL CONFERENCE ON BURNS—A Report of the Conference on Burns—Sponsored by the Colonial Research Institute at West End, Grand Bahama, March 23, 24, and 25, 1963. Dorrance & Company, Philadelphia, Pa., 1964. 209 pages, $12.50.

BASIC OTOLARYNGOLOGY—David A. Dolowitz, M.D., Associate Professor of Surgery; Chairman, Division of Otorhinolaryngology, University of Utah College of Medicine; Staff, Holy Cross Hospital, Salt Lake City. McGraw-Hill Book Company, (The Blakiston Division), New York, 1964. 383 pages, $12.50.

BODY FLUIDS AND THE ACID-BASE BALANCE—A Learning Program for Students of the Biological and Medical Sciences—Halvor N. Christensen, Ph.D., Professor of Biological Chemistry and Chairman of the Department, The University of Michigan. W. B. Saunders Company, Philadelphia and London, 1964. 506 pages, $6.50 (Paperbound).

CELLULAR INJURY—Ciba Foundation Symposium—Edited by A. V. S. De Reuck, M.Sc., D.I.C., A.R.C.S., and Julie Knight, B.A. Little, Brown and Company, Boston, Mass., 1964. 403 pages, $12.00.

CLINICAL NEUROLOGY—Frank A. Elliott, M.D., F.R.C.P., Chief of Neurology, The Pennsylvania Hospital; Professor of Clinical Neurology, University of Pennsylvania School of Medicine. W. B. Saunders Company, Philadelphia and London, 1964. 688 pages, $12.50.

CONDITIONING TECHNIQUES IN CLINICAL PRACTICE AND RESEARCH—Introduced and edited by Cyril M. Franks, Ph.D., Director, Psychology Service and Research Center, New Jersey Neuro-Psychiatric Institute. Springer Publishing Company, Inc., New York, 1964. 328 pages, $8.50.

DOCTOR'S EASACOUNT RECORD SYSTEM: DISBURSEMENTS, INCOME. W. B. Saunders Company, Philadelphia and London, 1964. $9.50 the Set; Singly, Disbursements: $4.00; Singly, Income: $5.50.

GENETICS AND MAN—C. D. Darlington. The Macmillan Company, New York, 1964. 382 pages, $7.50.

ILLNESS AND CURE—Studies on the Philosophy of Medicine and Mental Health—Joost A. M. Meerloo, M.D., Ph.D. Grune & Stratton, New York and London, 1964. 282 pages, $8.75.

LEFT-HANDEDNESS—Manual Superiority and Cerebral Dominance—By Henry Hécaen and Julian de Ajuriaguerra. Translated by Eric Ponder. Grune & Stratton, Inc., New York, 1964. 162 pages, $5.00.

MEDICAL CLIMATOLOGY—Edited by Sidney Licht, M.D., Honorary Member, British Association of Physical Medicine, Canadian Association of Physical Medicine and Rehabilitation, Danish Society of Physical Medicine and the French National Society of Physical Medicine and Rehabilitation; and assisted by Herman L. Kamenetz, M.D. Elizabeth Licht, Publisher, New Haven, Connecticut, 1964. 753 pages, $16.00.

MEDICAL DEPARTMENT, UNITED STATES ARMY—Preventive Medicine in World War II—Communicable Diseases, Volume VII (Arthropodborne Diseases Other Than Malaria)—Prepared and published under the direction of Lieutenant General Leonard D. Heaton, The Surgeon General, United States Army. Colonel John Boyd Coates, Jr., MC, USA, Editor in Chief; Ebbe Curtis Hoff, Ph.D., M.D., Editor for Preventive Medicine; and Phebe M. Hoff, M.A., Assistant Editor. Office of the Surgeon General, Department of the Army, Washington, D.C., 1964. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402; price $4.25. 397 pages.

MENTAL RETARDATION—A Review of Research—Edited by Harvey A. Stevens and Rick Heber. The University of Chicago Press, Chicago and London, 1964. 502 pages, $12.50.

MODERN NUTRITION IN HEALTH AND DISEASE—Dietotherapy—Third Edition—Edited by Michael G. Wohl, M.D., Chief of Nutrition Clinic, Philadelphia General Hospital; Clinical Professor Emeritus of Medicine, Temple University School of Medicine; Consultant in Medicine, Albert Einstein Medical Center, Philadelphia, Pa.; and Robert S. Goodhart, M.D., D.M.S., Scientific Director, The National Vitamin Foundation, Inc.; Physician-in-Charge, Washington Heights Nutrition Clinic, New York City Department of Health, New York, N.Y. Lea & Febiger, Philadelphia, Pa., 1964. 1282 pages, $20.00.

NEUROLOGICAL AND ELECTROENCEPHALOGRAPHIC CORRELATIVE STUDIES IN INFANCY—Edited by Peter Kellaway and Ingemar Petersen. A Conference and Symposium sponsored by the World Federation of Neurology and presented under the auspices of Baylor University College of Medicine with the support of the National Institutes of Health and Houston Endowment, October 2 and 3, 1963. Grune & Stratton, Inc., New York and London, 1964. 364 pages, $14.75.

NEW THOUGHTS ON OLD AGE—Edited by Robert Kastenbaum, Ph.D., Director of Psychological Research, Cushing Hospital, Framingham, Massachusetts. Springer Publishing Company, Inc., 44 East 23rd St., New York 10, N.Y., 1964. 333 pages, $7.50.

PRACTICAL PAEDIATRICS—Dr. Don Hilson, M.A. (Cantab.), M.B., B. Chir. (Cantab.), F.R.C.P.E., M.R.C.P., M.R.C.S., D.C.H., Consultant Paediatrician to the Oldham & District Hospitals, Ashton, Hyde and Glossop Hospitals, Oldham School Medical Service and Post-Graduate Clinical Tutor, University of Manchester. Grune & Stratton, Inc., New York, 1964. 462 pages, $12.75.

PRACTICE OF PSYCHIATRIC NURSING, THE—R. E. Bray, S.R.N., R.M.N., S.T.D., Principal Nurse Tutor, Tone Vale Hospital; Examiner to the General Nursing Council; and T. E. Bird, S.R.N., R.M.N., D.N.(Lond.), S.T.D., Nurse Tutor, Tone Vale Hospital. With forewords by Professor D. Russell Davis, M.A., M.D., F.R.C.P., D.P.M., Professor of Mental Health, University of Bristol, and J. W. Warboys, M.D., D.P.M., Consultant Psychiatrist, Tone Vale Hospital. The Williams and Wilkins Company, Baltimore, Md., 1964. 372 pages, $6.50.

STEREOSCOPIC MANUAL OF THE OCULAR FUNDUS IN LOCAL AND SYSTEMIC DISEASE—Frederick C. Blodi, M.D., Associate Professor of Ophthalmology, and Lee Allen, Associate in Ophthalmology, State University of Iowa College of Medicine, Iowa City, Iowa. With a Foreword by Alson E. Braley, M.D., Head and Professor, Department of Ophthalmology, State University of Iowa College of Medicine, Iowa City, Iowa. The C. V. Mosby Company, Saint Louis, 1964. 132 pages, $32.50. (Included with book are 105 stereoscopic views in full color on 15 View-Master® reels, and a View-Master® compact viewer.)

SUDDEN CARDIAC DEATH—Edited by Borys Surawicz, M.D., and E. D. Pellegrino, M.D., Grune & Stratton, Inc., New York, 1964. 222 pages, $9.50.

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ADVANCES IN THE TREATMENT OF MENSTRUAL DYSFUNCTION. Edited by Alvin F. Goldfarb, M. D. 188 pages. Illustrated. 1964. Lea & Febiger. $4.

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REFERENCES AND REVIEWS

Radioactive Contamination of the Human Diet and of Man—J. H. Harley (376 Hudson St., New York). Arch. Environ. Health, 9:649 (Nov.) 1964.

The present sources of radioactive contamination in the environment are fallout from nuclear weapons tests and radioactive wastes from industrial or medical activities. Only the fallout is presently measurable in man and in his diet. The total exposure from this source is somewhat less than that from the natural background radiation.

* * *

A Novel Method for Recording Tremor—S. Fisch et al (1036 Park Ave., New York). Amer. J. Med. Sci., 248:415 (Oct.) 1964.

The photomotograph, a commercially available inexpensive photoelectric apparatus which coupled to an electrocardiograph is used in determining thyroid function by registering the Achilles tendon reflex, was adapted to the recording of the tremor. The tremor of the hand exhibited by six patients with parkinsonism was recorded. The tracings compared well in frequency, variations, and amplitude with those reported by others with the more elaborate and expensive accelerator method. The photomotographic method satisfies the criteria of the ideal tremor recorder, and should prove valuable for the study of tremor in many conditions as well as in evaluating the effects of treatments.

* * *

Analysis of Oral Cytodiagnosis—B. L. Shapiro and R. J. Gorlin (School of Dentistry, University of Minnesota, Minneapolis). Cancer, 17:1477 (Nov.) 1964.

Exfoliative cytology was used to examine 404 intra-oral lesions. Histological material was available for comparison in 92 cases. Of 22 malignant tumors, five were considered cytologically negative for cancer; of 66 benign conditions, six had cytological suspicion of cancer. Although these statistics reflect relatively good accuracy for cytology, histologically confirmed cases represent less than 25 per cent of all cases. It was concluded that negative cytology could not be equated with benignity at this time, and that the role of cytodiagnosis in oral cancer detection is limited. Until adequate evidence is presented, intra-oral exfoliative cytology must be reserved for use with biopsy or for lesions so clinically innocent as to contraindicate biopsy.

* * *

Ocular Bobbing—C. M. Fisher (Massachusetts General Hosp., Boston). Arch. Neurol., 11:543 (Nov.) 1964.

In comatose patients with extensive damage to the pons as the result of hemorrhage or infarction, it was observed that the eyeballs intermittently dipped briskly downwards in unison. This movement termed "ocular bobbing" is a reliable sign of lower brain stem disease. Typical cases must be distinguished from bobbing occurring unilaterally or in association with hippus, pseudocoma, and sixth nerve palsy.

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California Medicine

Medicine in Society

Part I: Change and Challenge

MALCOLM S. M. WATTS, M.D.
San Francisco

The Committee to Study the Role of Medicine of the California Medical Education and Research Foundation (CMERF) is grateful to Dr. Watts for the following paper which served as the philosophical basis for the Committee's study and discussions. The Committee is also grateful to CMERF and to its president, James C. Doyle, for the encouragement and cooperation it has received in the course of its intensive study of a problem which is of great interest and concern to the medical profession of California.

Dr. Watts' background paper has served as a potent stimulus in directing the Committee's attention to the continuing dialogue between medicine and society, and in focussing on problems and issues which will be the subject of the Committee's Second Progress Report, *excerpts from which are scheduled for publication in the next issue of* California Medicine.

Samuel R. Sherman, M.D., *Chairman*
Committee to Study the Role of Medicine in Society

It is hardly necessary any longer to point out that an individual patient almost always has a high regard for his own physician but thinks less of other people's doctors, and that the public opinion of the medical profession as a whole leaves much to be desired. Yet it is just as necessary for the medical profession to have the trust and confidence of the public as it is for the individual physician to have the trust and confidence of his patient, if either is to be successful. Fundamentally, just as the opinion of the patient depends upon the performance of the physician, the opinion of the public depends upon the performance of the profession as a whole. There must be weaknesses in this performance if the public opinion of medicine is lower than it should be. These weaknesses seem to be not so much in the professional care of patients as in the broader social, economic and political areas of medical practice and medical care. Therefore, the relationships of medicine and society would appear to merit examination and reassessment by the profession as a whole.

This is Part I of a communication in three parts. Parts II and III will appear in successive issues.

A. Change in Ancient Relationship

From very earliest times, medicine in some form has been an integral component of every society. Medicine influences the social culture of which it is a part and in turn is influenced by it. This has always been and still is a dynamic and changing relationship. Today both medicine and society are changing more rapidly than at any time in history,

and the changes in both are more profound and far reaching than ever before. Both are having difficulty in adapting to these changes and each is showing signs of stress with respect to its relationships with the other. Yet neither can escape, either from the other, or from the ferment which scientific progress and social change are producing and which embroils them both.

1. *The Impact of Science*

A basic force which underlies the rapidly changing character of both medicine and society is the true scientific revolution which started at the turn of the century. As was the case with its earlier and more limited predecessor, the industrial revolution, the phenomenal new advances in scientific research began to receive public recognition and widespread general application in daily life some 40 or 50 years after they were first introduced. The impact of the substantial social and economic results of this new and continuing scientific revolution is now being reflected in political efforts to cope with these results. It is especially noteworthy that the scientific advances in medicine in particular affect almost every aspect of our culture and are in fact responsible for many of the revolutionary social changes which are occurring, and which in turn now affect medicine itself.

A most important and practical sociologic effect of scientific progress is that it inevitably produces increasing *specialization* among human beings. This specialization has occurred to a dramatic extent in both medicine and society during the last half century and this fractionation of function will increase as the scientific revolution proceeds. An inescapable corollary to increasing specialization is the greater *interdependence* among these specialized human beings which specialization produces. This has already occurred within medicine and within society and in the relationships between them.

All of this is an irreversible process. It can only go forward. Further scientific progress can only give rise to ever more complex social, economic and political problems from those which now beset us. This growing interdependence among specialized human beings inescapably requires increasing cooperation and greater order in the relationships among these interdependent individuals and groups. This can be accomplished either by voluntary assumption of individual and group responsibility or by government regulation and government control. There is no other way. These facts have profound implications for both medicine and society.

2. *Some Cultural Forces*

There appear to be a number of cultural forces which profoundly influence relationships between modern medicine and modern society that may be usefully examined. A few examples of such forces follow:

(a) Cultural beliefs, whether or not they are accurate or factual, profoundly affect medicine and society and the interrelations between them. For instance, the proposition that human beings are free and equal is an accepted cultural belief in the solid American tradition. Yet complete freedom or true equality can actually never be achieved within the framework of terrestrial life. Furthermore, they are fundamentally in conflict, in that one can only be attained at the expense of the other. Yet this almost completely accepted proposition determines much of the behavior of medicine and of our society.

(b) Americans are deeply committed to the concept of equal opportunity for all. Talcott Parsons presents the interesting suggestion that this may be linked to the American concern with health, in that poor health is considered to be no fault of the individual and is, therefore, an unfair discrimination for which society has responsibility and, therefore, must try to correct. If this be true, then here is a cultural force of great importance which may go far toward explaining many of our social attitudes toward the financing and distribution of medical care.

(c) Our Western society is presently engaged in an ideological, economic and political power struggle to decide to what extent the individual will be compelled to conform to the will and the habits of the majority as determined by government. The force of this struggle affects medicine in many ways. Medicine is primarily concerned with the patient, who as an individual is also the basic component of human society. Just as in illness, where the patient's disease or response to treatment may or may not be that of the majority, medicine instinctively knows that the full expression of human individuality in society is not to be found in any compulsion to conform. To date this power struggle has had more influence on medicine than medicine has had upon the power struggle.

There are many other cultural beliefs, some probably true and some probably not, which influence and actually determine the behavior of individuals and groups.

3. *A New Scholarship in Medicine*

Scientific and cultural forces such as these are compelling students of medicine and medical care to broaden their concepts of health and disease and to plumb more deeply the depth of the basic physical, biological, behavioral and social sciences for a better understanding of the new problems created by these forces. It has been well said that an understanding of health and disease now requires a

frame of reference in which the psychological, social and cultural aspects of human behavior are appropriately related to the biological nature of man and the physical environment in which he lives. A new scholarship in medicine and society is, therefore, developing to study the impact of these forces.

B. New Problems and New Responsibilities

The changes which are occurring in both medicine and society make it clear that modern medical practice and medical care have now become a complex professional and social system which can only become more complex as time goes on. Like any complex system, whether physical, biological or social in nature, this system needs order and direction if it is to run smoothly. The responsibility for this order and direction for medical care in modern society is presently in doubt. A crucial question is whether or not responsible free medicine and free enterprise can identify and solve the increasing problems produced by scientific progress as fast as they appear or whether they will be solved for better or worse by government regulation and control. This of course is simply the issue of free enterprise ideology versus the socialist ideology which so splits and confuses the world today.

To what extent has the medical profession examined its new responsibilities and what action has been taken to meet them? Let us consider a few of these new problems and new responsibilities.

1. *In Professional Practice*

In the area of medical practice, has medicine really studied and balanced the advantages and disadvantages of solo and various kinds of group practice in terms of modern patient care? Has it truly assessed the present and probable future role of paramedical technologists and technicians in medical care, and the responsibilities of the medical profession with regard to these groups who in fact enable it to serve many more patients much more efficiently? Has it faced up to all the important issues of professional discipline? Will such problems as these be resolved within the dimensions of voluntary free enterprise or by government regulation and control?

2. *In the Sociology of Medical Care*

There is a growing interdependence between and among physicians, hospitals, convalescent homes, nursing homes, public and voluntary health agencies. This is part of the new field of medical sociology or social medicine. How much longer will virtually every hospital in every community be able to provide virtually every service? Is it sound or necessary that every hospital try to have a cobalt bomb, a unit for heart surgery or an artificial kidney? Like medicine itself, hospitals will become increasingly specialized. As they do, there may have to be modifications in the present concepts of staff privileges. Who is to study these and other intricate interrelationships and interdependencies in the delivery of modern medical care? Will these problems which are at our doorstep be resolved within the dimensions of free enterprise or by government regulation and control?

3. *In the Economics of Medical Care*

Medical care is becoming more costly. The economics of medicine are of increasing importance to an increasing number of people. Who is to determine what the best medical care should provide, what it should cost, and how can it be paid for? Can these questions really be separated as many seem to think they can? Someone will answer them. Who is to discover the economic wastes, the inadequacies, the over-uses, the exploitation in various forms of government or voluntary medicine? Someone will do it. Who is to identify the unmet needs of minority groups, needs for new or modernized hospitals and facilities and do something about them? Will these problems be resolved within the dimensions of free enterprise medical care or by government regulation and control?

4. *In the Structure of Organized Medicine*

How can free and independent individuals or any association of free and independent individuals hope to solve problems such as these? Perhaps free medicine's greatest problem lies right in its own democratic political system. Yet if freedom is to be preserved and a greater progress is to be made through the system most capable of progress then these problems must be identified and solved within this system, and this must be done on an ever broadening and more complicated scale as the problems of human interdependence are compounded from this time on by further scientific progress.

Is it not time for us to come to grips with these realities? Many are beginning to think so but the question is, How? Perhaps we can borrow a leaf from the book of biological evolution and apply some biological principles to this evolutionary process of which we are a part. There are still free and independent cells in the animal kingdom, but the higher forms of life have found it necessary to develop specialization of cells and interdependence among cells. This has made possible a more advanced form of life and of living. A major key to this improved performance has been the biological development of specialized functions for communications within the organism itself and between it

and its environment, and of an intelligence to deal with an environment which changes from moment to moment, from day to day, and over much longer periods of time. The parallel with modern medicine and modern society is close. Perhaps medicine too needs some sort of better organized central nervous system to deal with its internal and external problems in a changing environment.

C. Performance and Leadership

An inevitable corollary of order and direction is control. No system complex can operate for long without introducing some sort of control. This is true of social systems where human beings must work interdependently as well as of physical or biological systems. Basically, control in any social system can only be exercised by the voluntary assumption of responsibility, or by compulsory regulation. The advantages of the voluntary method over the compulsory method are many and obvious. The only question is whether it can be made to work well enough. Can the social systems of medicine, of society, and of modern medical care all function smoothly within the framework of voluntary assumption of responsibility, and what are to be the pressures to volunteer? The answer to this question remains in doubt both for medicine and for society.

All these issues of order, direction, control and leadership will be decided in the final analysis by performance. Medicine of high quality and ready availability is essential to any modern society. The essential elements of medical care now extend far beyond the competence of any physician and the adequacy of any facilities he himself controls. Social, economic and political problems which strike at the very roots of our way of life are involved. Organized medicine has so far been loath to take on this complicated task but it has also resisted and decried the efforts of others to assume leadership and responsibility. It would seem that control of medical care and of medicine itself will fall to whomever can demonstrate that he can make the system work. And whoever performs in this fashion will also perform the ancient social role of the "physician" to modern society.

At present there is a vacuum of leadership in medical care. There are several major contenders for this important responsibility. Each represents a segment of the complex of modern medicine in modern society. Some of the more important are discussed below:

1. *The Payor*

Those who pay the bills are in a position to exercise direction and control of the complex that is medical care. The insurance industry, management and labor and the government in various programs are all involved in its financing. The scope and nature of their involvement places these groups in a powerful position to demand and get the services they want, and thus to exercise leadership and control. Such groups usually choose their own advisors and accept or reject advice as they see fit.

2. *The Hospital*

There is a growing tendency to center medical practice and medical care around the large general hospital. This trend reflects progress in scientific medicine and will increase as medical services become more complex and more of them must be carried on in a hospital setting. This will place those who are responsible for hospitals more and more in a position from which it will be almost impossible not to exercise direction and control of medical care. However, the governing boards of hospitals are seldom controlled by physicians. Often physicians are not even represented. Hospitals are the traditional responsibility of lay groups or of government.

3. *Public Health*

A study group of the United States Public Health Service has concluded that the organization and distribution of medical care is a proper concern of public health. It has been recommended that funds of the department be directed toward establishing leadership in this field, and to the gathering of factual data on the subject. This is a clear departure from the traditional role of public health and could presage the replacement of personalized medicine in patient care with a more bureaucratic and impersonal statistical approach to medical practice, should the public health philosophy of control of disease by regulation become increasingly applied in daily practice.

4. *The Academic Center*

As further scientific advances are made in medicine the academic centers themselves, as educational institutions, may come to have a greater and greater influence on medical practice and medical care. Practitioners of necessity will become increasingly dependent upon these educational centers which will determine what practitioners must learn to keep abreast of progress and give recognition to those who do, and so set professional standards. Similarly, those who are responsible for the organization of medical care may become increasingly dependent upon academic schools of hospital administration, public health and the like. All this can place the university medical center in a strong position to exercise broad leadership and control in medical practice and medical care.

5. *The Social Scientist*

As medical care in modern society has increased in complexity, its quality, availability and delivery have become a matter of growing interest to sociologists and students of social welfare. Many scholars in these fields are specializing in the field of medical care, and many of them are becoming increasingly qualified as authorities in the organization, distribution, direction and control of medical care. At the moment these scientists are working in the vineyard but their growing knowledge of quality, cost and distribution makes them strong contenders for leadership and even for the role of "physician" to society.

6. *Organized Medicine*

Organized medicine has been curiously lacking in this struggle for leadership in medical care. The initiative has been taken by others. Perhaps this is because physicians have been so absorbed in advancing their science, and applying it in daily practice, that they have not attended to the social responsibilities of the profession in medical care and in society as a whole.

Perhaps it is time for the medical profession or for organized medicine to review critically its position with regard to society and to determine consciously the role it wishes to play in the future.

D. Some Basic Questions

From very ancient times, medicine in some form has been an integral component of every society. Our society is no exception. Medicine is so much a central part of our society that it affects almost every aspect of our culture. As medicine has increased in complexity and become specialized in the wake of scientific progress, many of its traditional functions have been assumed by other professions and other components of society. At the present moment medicine itself seems divided as to whether it should limit itself to its scientific functions in medical practice and medical care or should assume some responsibility for, and some direction of, the larger and traditional responsibilities of medicine in society.

Perhaps it is time that certain basic questions were posed and answered:

1. What are the true dimensions of medical science in medical care?
2. How far does medical care extend into the structure of our society?
3. To what extent is medicine concerned with diseases and disorders in and of society—with problems such as delinquency, crime, alcoholism, fitness of an individual to drive a car, or with the fitness and safety of the environment, be it the atmosphere, an industrial plant or an automobile?
4. What are the true implications of medicine's commitment to "the advancement of the science and art of medicine and the betterment of public health?"
5. To what extent should medicine be concerned with the biological survival and evolution of the human species and its culture?

These are fundamental questions. Basically they ask what is the definition of modern medicine and who is to be physician for modern medicine to modern society. At the moment no one plays this essential role and in a very real sense society is seeking its physician.

It is suggested that organized medicine address itself to an assessment of the responsibilities of modern medicine in modern society and arrive at a determination of the role which it wishes itself to play. It should decide whether it will assume the responsibility of resolving the social problems of medical care in both medicine and society by strengthening order, direction and leadership within the dimensions of the free enterprise system, or whether through disinterest, disunion, procrastination or failure to perform, it will in effect bring about government regulation and control by its own default.

Parts II and III of this communication in three parts will appear in later issues.

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The Artificial Cardiac Pacemaker

Indications for Implantation

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■ *Extensive clinical experience has demonstrated that implantable cardiac pacemakers are safe and effective mechanisms for controlling symptoms and preventing the hazards of third degree heart block with Stokes-Adams syncope. Medical management of this disease does not provide reliable protection and life expectancy averages about two years after diagnosis. Hence the negligible surgical morbidity and mortality associated with pacemaker implantation justifies broad indications to implant one of the four commercially available battery-powered units.*

Elective implantation of a pacemaker should be considered in patients with persistent third degree heart block who have had: One or more episodes of Stokes-Adams syncope; surgical injury to the conduction system, regardless of syncopal attacks; evidence of low cardiac output with cardiomegaly secondary to bradycardia. Few if any other cardiac arrythmias are satisfactorily controlled by an electrical pacemaker.

Emergency pacemaker control is obviously necessary for patients developing intractable or recurrent bouts of asystole. During the interval until an implantable unit can be obtained and sterilized, the patient may be controlled by intravenous isoproterenol or by an external pacemaker attached to a transvenous catheter electrode, a precordial skin electrode or a percutaneous myocardial wire electrode.

AMPLE CLINICAL EXPERIENCE has clearly demonstrated that complete heart block associated with Stokes-Adams disease carries with it the threat of unpredictable sudden death; the average life expectancy after diagnosis is between 22 and 26.2 months.[1,8] Although the mechanism of death is rarely documented, it is reasonable to presume that irreversible asystole is the cause in many instances. In others death may result from congestive heart failure which is compounded by a slow idioventricular rate. Since the hazards of the artificial pacemaker have been demonstrated to be distinctly lower than those of persistent heart block with Stokes-Adams attacks, every patient with this disease deserves to be considered a candidate for a reliable cardiac pacemaker, either pharmacological or artificial, immediately after the first attack.

On the basis of clinical experience involving 35 patients with various external and implantable cardiac pacemakers over a period of five and a half years the purpose of this report is: To set forth the effective measures for the control of Stokes-Adams

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attacks and total heart block that should precede the consideration of permanent pacemaker control; to define the indications for implantation of the pacemaker; to recommend a course of management for patients in imminent danger of death while they are being prepared for implantation of the pacemaker; to provide current information about the features, costs, reliability and hazards of the various commercially available implantable pacemakers; and to report the problems and complications that may occur after a pacemaker has been implanted.

The first clinical use of an external cardiac pacemaker was reported by Weirich[11] in 1958 for temporary control of surgically induced heart block. The necessity of maintaining a transcutaneous tract for wires carrying the electrical impulses to the heart led to uncontrollable complications of chronic sepsis and wire breakage when long-term stimulation was required. The first entirely internal pacemaker, employing small cadmium-mercury batteries as a power source, was reported in October 1960 by Chardack.[2] Other models of similar design but with slightly varying features have been developed commercially* and have been employed clinically in approximately 4,500 patients, largely within the past two years.

Early experience with these machines showed that they were not fully reliable; all of them had problems associated with limited battery life, wire-electrode fatigue and electronic defects. Numerous changes, however, have greatly improved their long-term performance.

Medical Management of Stokes-Adams Disease

Implantation of an electrical pacemaker is by no means indicated in every patient with total atrioventricular dissociation. Traditional methods of medical control are adequate in some patients to prevent severe bradycardia and to forestall Stokes-Adams attacks, but they tend to be transient and unreliable for continuous protection. Of the various sympathomimetic drugs, the most effective has proved to be isoproterenol which acts almost exclusively as an ionotropic agent and is not a vasoconstrictor. Five to 15 mg sublingually or rectally will produce a significant response in the heart rate, with few side effects. However, the duration of action is brief (20 to 30 minutes at most) and resistance to its effects usually develops in a few weeks or months. In addition, prolonged sublingual application may result in mucosal ulceration. Epinephrine in oil by injection, ephedrine and amytal by mouth, and other drugs have been tried with variable and usually disappointing results in terms of permanent protection against Stokes-Adams attacks.

Prolonged reversal of atrioventricular dissociation has been accomplished in selected patients and is worthy of clinical trial. Tobian[9] has reported the successful reversal and prevention of third degree heart block during controlled hypokalemia induced by chlorothiazide diuresis. Steroids have been successfully used to abolish third degree heart block and to maintain normal sinus rhythm in a relatively small group of patients. It is our custom, when conditions permit, to give each patient a seven-day course of prednisolone or prednisone up to 60 mg per day before considering implantation of a pacemaker. If conversion to sinus rhythm occurs, the patient is maintained on steroid medication indefinitely or until he becomes refractory to treatment. Reports by Friedberg[3] and Verel[10] on the use of steroids are encouraging, but it is inferred that the effect of steroids may be limited to early and reversible heart block since the results are based only on patients with heart block of less than one or two months' duration.

Indications for Pacemaker Implantation

Any patient who has had one or more Stokes-Adams attacks caused by third degree heart block and who has not had conversion to sinus rhythm with the measures outlined above is a candidate for a pacemaker. Although the frequency and severity of Stokes-Adams attacks may be a general index of imminent danger to the patient, it is impossible to predict whether or not even a second attack will be fatal. Since there is no way to assess the hazards of delaying specific therapy, the clinician must assume a heavy burden of responsibility in withholding an effective therapeutic measure unless the patient cannot safely withstand a relatively simple surgical procedure. While it is true that many patients can be successfully managed by conservative measures for long periods, the prognosis is very poor and the average life expectancy after the first attack is less than three years.

Congenital or acquired total heart block in the absence of Stokes-Adams attacks has seldom been considered an indication for pacemaker implantation. However, our experience with patients after increasing their heart rate with a pacemaker suggests that the low output of profound bradycardia often leads to incipient and overt decompensation. Several patients have had spontaneous diuresis of large volumes of urine after having their cardiac rate doubled with the pacemaker (Chart 1). They often report a significant improvement in their physical capacity, a disability about which they had not complained preoperatively. This experience suggests

*Electrodyne, General Electric, Medtronic, Cordis, and Joseph Lucas, Ltd., Birmingham, England.

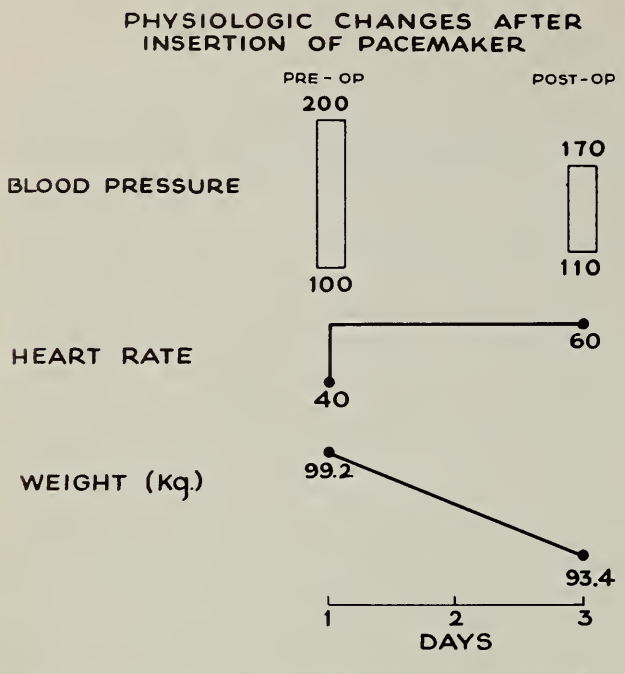


Chart 1.—Physiologic changes after insertion of a pacemaker in a 58-year-old man with total heart block.

that extreme bradycardia alone may be an indication for pacemaker control.

Surgically induced total heart block after closure of a ventricular septal defect or a defect in the atrioventricular canal may be temporary and may revert spontaneously in the early postoperative course (one to two days). Patients with persistent block, however, seldom survive over a year and often die of the first Stokes-Adams attack. We concur with Lillehei[5] that no patient with permanent heart block should be permitted to leave the hospital without an implanted pacemaker which is usually inserted after about four postoperative weeks of hopeful delay. Pacemakers are seldom if ever indicated for the control of other cardiac arrhythmias and may indeed be dangerous if used improperly.

Management Before Implantation

It is seldom practical to carry out immediate surgical intervention when the decision to operate has been reached, (but sterilized implantable pacemakers are promptly available in most cities). When frequent bouts of asystole are occurring it is essential to have reliable means of interval management. We dealt with two patients with intractable Stokes-Adams disease who required repeated resuscitation and constant ventricular stimulation from the time they were put in hospital to the time that a satisfactory pacemaker could be obtained and sterilized. Preoperative control of the ventricular rate is essential in patients of this type and is desirable in all patients with total heart block, since asystole or ventricular fibrillation can otherwise occur during induction of anesthesia.

Various measures have been employed for managing the patient during this critical period:

- Intravenous isoproterenol (five to ten mg in 500 ml of five per cent dextrose in water) can be carefully titrated to produce a ventricular rate between 60 and 80 beats per minute. This simple maneuver usually provides safe and reliable protection for several days. It can be conveniently maintained during induction of anesthesia and during the operative procedure until the electrodes are implanted. This technique has proved effective in all but the two previously mentioned patients.
- Stimulation with an external pacemaker has been reported by Zoll[12] to control ventricular rate effectively, but we have been dissatisfied with this technique because of the severe discomfort to the patient produced by the surface electrical charge. Furthermore, the presence of a surface electrode in or near the operative field is a nuisance and a hazard to proper preparation of the area.
- Intracardiac pacemaker control through a percutaneous catheter electrode has been recommended and successfully employed.[4,7] This method, however, has the disadvantages of requiring anticoagulative treatment before a surgical procedure and of introducing the hazards of intravascular contamination, pulmonary embolism and perforation of the myocardium. In one of the patients in the present series in whom this method was attempted persistent arrhythmias and ventricular fibrillation developed from the pacemaker stimulus.
- A percutaneous insulated electrode wire with a hooked tip can be introduced through a spinal needle into the left ventricle for temporary stimulation with an external pacemaker when other measures are ineffective. We have used this method successfully in three patients, attaching the opposite pole of the pacemaker to an indifferent subcutaneous electrode.

Available Implantable Pacemakers

The important features of commercially available pacemakers of American manufacture (Figure 1) are reviewed in Table 1. They are similar in many ways. Each consists of a compact electronic unit powered by small cadmium-mercury batteries that deliver a short electrical impulse through attached insulated wires to two electrodes implanted in the myocardium. Each of these units is encased in a watertight silastic jacket which is well tolerated in the subcutaneous tissues of the abdomen or chest. Based on fatigue experiments, the estimated battery life at the stated current outputs varies from three to ten years. When battery power is exhausted it

is necessary to replace the entire pacemaker, since none of them is constructed for battery replacement. Although the electrical impulse may be monophasic or biphasic, its duration (two milliseconds) and peak current (14 amperes) are below the threshold that would produce ventricular fibrillation if the impulse were to occur during the vulnerable phase of the normal cardiac cycle.

Important differences exist between the models listed in Table 1. The Medtronic pacemaker is equipped with an accessory "pigtail" wire which can be delivered through a tiny incision in the abdominal skin without disturbing the main apparatus. After removing the insulation and making appropriate connections on the three wire leads, this accessory wire makes it possible either to bypass a resistor and double the current output (which has been necessary on three occasions in our series), or to connect an external pacemaker to the internal wires (bypassing the implanted pacemaker) or testing wire breakage or providing emergency stimulation.

The Medtronic pacemaker and the Cordis Atricor pacemaker have electrode wires that are detachable from the main instrument, a feature which permits repair of a broken proximal wire or replacement of the pacemaker itself without the necessity of opening the chest to replace the electrodes.

The Medtronic pacemaker has as an optional accessory feature (at $100 additional cost) a mechanism by which the rate and output of current can be altered by the percutaneous insertion and rotation of a triangular needle. Lillihei[5] described four patients who might have benefited from a controllable rate but in our experience there has been no occasion when we have felt that the patient would be helped by a change in rate.

The General Electric pacemaker has an optional



Figure 1.—One of the currently available implantable pacemakers of American manufacture.

accessory (at an additional cost of $350) consisting of a separate power unit and external coil. The coil can be placed on the skin over the implanted pacemaker to transmit an induction current which temporarily increases the pacemaker rate. When the external coil is removed the basic pacemaker rate is reestablished. This feature may be of value in some young persons who wish to exercise vigorously and for that reason require a temporarily higher cardiac rate.

The Cordis Atricor pacemaker is considerably more complicated than the Medtronic or General Electric pacemakers and employs the idealistically desirable feature of picking up the p wave from the atrium and amplifying the impulse through the ventricular electrodes; in that way, it essentially

TABLE 1.—*Features of Current Commercially Available Implantable Cardiac Pacemakers (October 1963)*

Features	*Brand*			
	Medtronic (Minneapolis)	*General Electric (Schenectady)*	*Electrodyne (Boston)*	*Cordis Atricor (Miami)*
Clinician developing	Chardack	Kantrowitz	Zoll-Frank	Nathan
Units implanted	2500	300	1000	22
Cost	$645*	$650 (+$350†)	$425	$850
Rate	Factory fixed (ext. adjust.)‡	Factory fixed	Factory fixed	p wave synchrony
Wave form	Biphasic	Biphasic	Monophasic	Monophasic
Voltage	3.5-10	3.7	7.0	6.5
Duration (millisec)	1.7-2.2	1.7-2.0	2.0	1.7-2.0
Current (milliamp)	3.5-10	12	14	10
Energy (microjules)	225 Max.	65	196	110-120
Attachment	Removable	Permanent	Permanent	Removable
Lead wires	Platinum-iridium coil	Stainless Steel multistrand	Platinum-gold plated multistrand	Platinum coil
Component parts	15	<20	<20	52

*Includes $120 for detachable wires.
†Additional for external induction coil.
‡Available at extra cost.

reestablishes normal sinus rhythm.[6] While this feature may be of importance to some patients, the added complexity with its accompanying increased possibility of malfunction may not be justifiable. More extensive clinical experience will be necessary to determine the reliability of the instrument and its comparative benefit to the patient.

In all currently available pacemakers, the wires leading to the myocardial electrodes are subjected to continuous motion and are occasionally subjected to external trauma. Maintenance of long-term continuity has been a major problem. The Medtronic pacemaker is equipped with coiled platinum-iridium wires (developed by Chardack) which are also used in the Cordis Atricor pacemaker. The Electrodyne and General Electric pacemakers are equipped with wires of very fine multistrand gold-plated platinum which is alleged to endure multiflexion without breaking. Although significant breakage may be caused by the inherent characteristics of the wires, more probably the kinking that takes place during the handling and implantation of the apparatus and the methods used for fixation are major causes of ultimate wire breakage.

Problems and Complications

No information is yet available on the total experience with implanted pacemakers and because of the diversity of interests involved it is unlikely that accurate data will ever become available. Of the various failures that we have encountered, many can be attributed to improper handling. The number of these has decreased as experience has grown. However, it is evident from our own series and from episodes reported in personal communications that problems have arisen from the use of all of the models described, although they have become increasingly reliable in recent years. In no instance has either the apparatus itself or its failure to function properly led to a serious complication or to death.

When problems and complications occur, it is frequently impossible to establish whether they arise from a defect in the apparatus or from an unrecognized mishandling of the pacemaker. In the former category we have encountered the following: Electronic failure of the unit in one case; current output that was inadequate for the maintenance of constant pacing in two cases (a defect that subsequently required short circuiting the accessory resistor); and wire breakage inside the myocardial electrode plate in two cases.

In other instances, in retrospect, it seems probable that some kinking was produced at the point of breakage during the process of implantation: either during insertion of the pacemaker into the abdominal pouch, or while drawing the wires through the tunnel of skin, or during the insertion of the electrodes into the myocardium. While the ideal apparatus would be built to withstand these iatrogenic insults, there still remains the practical problem of providing wire electrodes that will not fatigue with constant motion. When a broken wire is encountered it can sometimes be reinserted into the pacemaker (in the case of Medtronic and Cordis Atricor) or the broken end can be stripped of insulation and implanted subcutaneously as an indifferent electrode. Frequently, however, the myocardial electrodes and the entire unit must be replaced.

Sepsis was a problem in one case in which unsterile silastic glue was inadvertently used. Tissue breakdown at the wound necessitated removal of the pacemaker.

Diaphragmatic flutter synchronous with the heart beat occurred in two patients but in neither case was it troublesome. In one case the flutter was corrected when the pacemaker was changed after a wire breakage.

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REFERENCES

1. Bruns, D. L., Gardner, R. E., Rivkin, L. M., and Roe, B. B.: The problem of complete heart block, Am. J. Surg., 106:357, 1963.

2. Chardack, W. M., Gage, A. A., and Greatbatch, W.: A transistorized, self-contained, implantable pacemaker for the long term correction of complete heart block, Surgery, 48:643, 1960.

3. Friedberg, C. K., Kahn, M. Scheuer, J., Bleifer, S., and Dack, S.: Adams-Stokes syndrome associated with chronic heart block. Treatment with corticosteroids, J.A.M.A., 172: 1146, 1960.

4. Furman, S., Schwedel, J. B., Robinson, G., and Hurwitt, E. S.: Use of an intracardiac pacemaker in the control of heart block, Surgery, 49:98, 1961.

5. Lillehei, C. W., Sellers, R. D., Bonnabeau, R. C., Jr., and Eliot, R. S.: Chronic postsurgical complete heart block. With particular reference to prognosis, management, and a new p-wave pacemaker, J. Thor. Cardiovasc. Surg., 46:436, 1963.

6. Nathan, D. A., Center, S., Wu, C. Y., and Keller, W.: An implantable synchronous pacemaker for long term correction of complete heart block, Am. J. Cardiol., 11:362, 1963.

7. Parker, B. M., Shine, L. C., Burford, T. H., and Williams, K. R.: Indwelling electronic cardiac pacemakers, J.A.M.A., 186:754, 1963.

8. Penton, G. B., Miller, H., and Levine, S. A.: Some clinical features of complete heart block, Circulation, 13: 801, 1956.

9. Tobian, L.: Prevention of Stokes-Adams seizures with chlorothiazide, N.E.J.M., 265-623, 1961.

10. Verel, D., Mazurkie, S. J., and Rahman, F.: Prednisone in the treatment of Adams-Stokes attacks, Brit. Heart J., 25:709, 1963.

11. Weirich, W. L., Paneth, M., Gott, V. L., and Lillehei, C. W.: Control of complete heart block by use of an artificial pacemaker and a myocardial electrode, Circ. Res., 6:410, 1958.

12. Zoll, P. M.: Resuscitation of the heart in ventricular standstill by external electric stimulation, N.E.J.M., 247:768, 1952.

Detection of Cervical Cancer

A Study of Motivation for Cytological Screening

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■ *Annual cytological examination of cervical scrapings should virtually eliminate deaths from cervical cancer, but many deaths still occur because not all women are sufficiently motivated to have the examination.*

As part of a San Diego County Medical Society cancer control project, 2000 women were interviewed to evaluate motivating influences. It was found that most of the 70 per cent who had had the examination were motivated by the advice of physicians, rather than directly by lay publicity. Women who had not had the examination, more commonly the old and the poor, were not antagonistic but mostly unmotivated. Lay education to induce women to seek medical advice, and education of physicians to get them to urge and to carry out their part in routine annual cytologic examination of cervical exudate probably could bring about virtual elimination of death from cervical cancer.

IT IS GENERALLY BELIEVED that most deaths from cervical cancer could be prevented through routine annual cytologic examination of cervical scrapings or exudate. A number of population screening projects have been organized to eliminate death from cervical cancer in this manner.[1,4,5,6] In all these projects adequate clinical means of collecting specimens and of examining them were developed, but in none of the projects was a way found to induce all women to have the examination. Better methods to get them to do so are needed.

Why are some women motivated to have Papanicolaou smear examination while others are not? How effective is public education in press, radio and television compared with education imparted directly by physicians in their daily doctor-patient relationships? What population groups are resistant and how may their resistance be overcome? San Diego County, California was chosen for a study to answer these questions because its population has been exposed for several years to continued and varied educational pressures and its physicians have been constantly urged to screen all their patients in an effort to achieve total population screening.[4]

In 1956, the San Diego County Medical Society started a uterine cancer control screening project. A Uterine Cancer Control Committee was appointed. Private laboratories agreed to provide volume screening at reasonable cost. A central registry* received duplicate cytology reports from all eight major laboratories participating. Provision was made for free screening of indigent patients at San Diego County Hospital and for low cost screening for low income patients attending Mercy-Guadalupe part pay clinic. All through the operation of this project, a sustained effort in public education was made by the County Health Department, the San Diego Branch of the American Cancer Society and the San Diego press. The film, "Time and Two Women," was widely shown. The science writer of the San Diego press contributed a number of feature articles. At the same time, the medical society through its publications, and the committee in many talks

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*This registry was supported in part by the National Cancer Institute and later by a Community Cancer Demonstration Project Grant from the U.S. Public Health Service.

before medical gatherings, continued to urge all physicians to recommend annual cytologic examination to all adult female patients seen in private practice.

At the time of the 1960 census, San Diego County had a population of approximately one million people, about half within the city of San Diego and half in other cities and rural areas. About 300,000 people of the San Diego County population in 1960 were adult women, age 20 or more.

In 1961, the first interview study was conducted, using a cross-section population sample of 1,000 representative women residing within the city of San Diego.[2] In 1962, an additional 1,000 representative women residing in the county, outside the city of San Diego, were interviewed.[3] Members of both population samples were selected by a random procedure from census tracts, in proportion to the percentage of women age 20 and over, within each tract, as reported in the 1960 census figure. For example, Tract-D 23 had 1.0 per cent of women age 20 and over in the city of San Diego, according to the census; therefore, ten interviews, or 1 per cent of all interviews, were completed in Tract D-23. Within each tract, blocks were selected at random. Within each block included in the sample, the starting address was chosen by a random procedure. All women, age 20 and over, in a selected dwelling unit were members of the sample. Authenticity of the representative population sample was confirmed by a close correlation in different age groups between census figures and the sample. All interviews were conducted in the home by trained and experienced women interviewers under the direction of Oscar J. Kaplan, Ph.D., in the name of the San Diego Branch of the American Cancer Society. Answers were machine-analyzed and cross-tabulated.

In order to learn what proportion of San Diego women had been screened at least once, the following question was asked:

Q: *Have You Ever Had a Pap Cancer Smear* of the Cervix?*

		1,000 Women City—1961	*1,000 Women County—1962*
A:	Yes	62%	72%
	No	34	26
	Don't know	4	2

It is evident that by 1962 the San Diego project had succeeded in screening approximately 70 per cent of the adult female population at least once. This left 30 per cent of the population yet unscreened. A distressing number of invasive cervical cancers are still being seen in San Diego hospitals, mostly from among the 30 per cent of the population missed by the "Pap screen."

*This term was generally understood by women who were questioned.

In order to determine the relative importance of different motivating influences, the following question was asked in the 1961 study:

Q: *What Led You to Get Your First Pap Cancer Smear?*

A:	1. Recommended by doctor	76%
	2. Part of regular physical examination	12
	3. Realized importance of test, asked for it	4
	4. Article in newspaper or magazine or TV program	4
	5. Recommended by friend or relative	2
	6. Saw cancer film, "Time and Two Women"	2
	Total	100%

While a relatively insignificant proportion of women gave lay educational measures the primary credit for their motivation, it may be that lay publicity helped in getting them to seek medical advice.

All women who answered that they had never received a cancer smear (30 per cent) were asked why:

Q: *Is There Any Reason Why You Haven't Had a Pap Smear Cancer Test?*

A:	1. Never heard of test	30%
	2. Doctor didn't recommend it	24
	3. Never thought of it	23
	4. Feel healthy: nothing wrong with me	7
	5. Too busy: No time to go to doctor	5
	6. Don't believe in test	4
	7. Too expensive	2
	8. Other answers—Don't like doctors, Afraid of answers, Religious reasons	1
	9. Had hysterectomy	4

It seems clear that the great majority (77 per cent) of women who had not been screened, were missed because of lack of knowledge, lack of a physician's advice or simply lack of sufficiently strong motivating influence. Inducing these women to have the examination should be easy. Answers 4 and 5, accounting for an additional 12 per cent of those who had not had the test, indicate an attitude of indifference and possibly resistance. Only answers 6, 7 and 8, totaling only 7 per cent of the 30 per cent minority who were untested, indicated strong resistance and perhaps disbelief in the medical profession as guardians of health. Thus, only about 2 per cent of the entire population sample expressed overt resistance to having smears. With sufficient motivating effort, more than 95 per cent of the population could probably be screened.

Probing further into the influence of physicians, women who had not had a smear were asked:

Q: *Has a Doctor Ever Suggested That You Have a Pap Cancer Smear Test Made?*

A:	1. Yes	4%
	2. No	93
	3. Don't remember	3

Again, the vast majority of women (93 per cent) who had not been tested, simply had not yet been exposed to a physician's motivating influence.

In searching for deterrent influencing factors, all women were asked:

Q: *How Much Confidence Do You Have in the Ability of Doctors to Find and Cure Early Cancer?*

	1961	1962
A: 1. Great deal	58%	62%
2. Moderate amount	28	21
3. A little	6	4
4. No confidence	5	3
5. Some kinds of early cancer can be cured; others can't	1	4
6. Don't know enough about it	2	4
7. Depends on doctor	0	2

The majority of women (86 per cent) in 1961 and 83 per cent in 1962) had confidence in the ability of physicians to find and cure early cancer. Lack of faith in physicians is apparently not a frequent deterrent influence.

The cost of obtaining a smear has often been held to be a deterrent influence. Accordingly, all 1961 respondents were asked:

Q: *How Much Did You Pay for Your Last Pap Cancer Smear Test?*

A: 1. $5.00 or less	22%
2. More than $5.00	10
3. Don't remember	54
4. No charge	14

It was a surprise to find that more than half the respondents did not remember how much the examination cost. Answering another question, of those who stated they were not planning to have another test, only 3 per cent gave financial reasons. Evidently cost in San Diego County is not a major deterrent.

Cross-tabulation studies were made to determine the relation of economic status to ease of motivation toward having routine cytologic examination:

	Annual Income (Dollars)				
	Less Than 4,000	*4,000 5,999*	*6,000 7,999*	*8,000 9,999*	*10,000 and Above*
Had examination	42%	61%	72%	78%	88%
Did not have	53	36	25	19	9
Don't know	5	3	3	3	3
Total	100%	100%	100%	100%	100%

Another cross-tabulation relating education to cytologic examination shows identical trends, as would be expected since education levels and income levels tend to be parallel.

Study of the data also showed a significant relationship between the age of a woman and whether or not she had had cytologic examination:

	Age (Years)				
	20-29	*30-39*	*40-49*	*50-59*	*60+*
Had examination	56%	72%	76%	64%	39%
Did not have	40	25	22	32	55
Don't know	4	3	2	4	6

This observation is important, not only because cancer is a disease of aging tissues, but also because more and more people are reaching advanced age.

Discussion

It seems probable that if sufficient motivating influences were directed in channels suggested by these findings, virtually all women in a given area would have cytologic examination and medical control of cervical cancer would become a reality. Most people still turn to physicians for advice on medical matters. Only a negligible proportion of a representative sample of women expressed feelings of antagonism or disbelief in the ability of physicians to find and cure early cancer.

Efforts to influence and motivate women through a program of physician education have apparently been most rewarding. Almost three-quarters of the population in the county studied had been screened, directly as a result of physician-patient educational influence. Most of the women who had not been screened had not been exposed to any physician-patient motivating influence. There is no reason to believe they would resist if they were so exposed.

On the other hand, efforts to motivate women directly through lay publicity and lay educational measures have not resulted in large numbers of women seeking cytologic examination of cervical exudate. Even among women who have been screened, knowledge of the importance of the examination and the methods involved seems generally vague. Attempting to motivate a population by imparting knowledge of the importance of cytologic examination, especially among the aged and the economically depressed seems almost too monumental to be practical.

If lay measures can motivate women to see physicians, physicians can easily motivate women to have cytologic examinations. This approach to total population screening seems the practical one in the light of the present survey. All physicians who see women should be urged to insist on annual cytologic examination of cervical exudate. No other laboratory test is so rewarding in detecting silent serious disease.

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1. Erickson, C. C., Everett, B. E., Graves, L. M., Kaiser, R. F., Malmgren, R. A., Rube, I., Schrier, P. C., Cutler, S. J., Sprunt, D. H.: Potential screening for uterine cancer by vaginal cytology, J.A.M.A., 162:167-183, 1956.

2. Kaplan, Oscar J.: What are the characteristics of a population who have had a Papanicolaou examination and those who haven't?, Papanicolaou Smear Survey, City of San Diego, American Cancer Society, San Diego Branch, June, 1961.

3. Kaplan, Oscar J.: Papanicolaou Smear Survey, County of San Diego (excluding City of San Diego), American Cancer Society, San Diego County Branch, 1962.

4. Martin, P. L.: Total population screening for cervical cancer, West. J. Surg., Obst. & Gynec., 66:288-292, 1958.

5. Nieburgs, H. E., Stergus, I., Stephenson, E. M., Harbin, B. L.: Mass screening of the total female population of a county for cervical carcinoma, J.A.M.A., 164:1546-1551, 1957.

6. Spencer. Frank C.: Cytological survey of squamous carcinoma of the cervix, Am. J. Obst. & Gynec., 86:646-652, July, 1963.

Roentgen Examination of Soft Tissues of the Pelvis

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■ *With meticulous preparation of the patient and with careful technique, the soft tissues of the pelvis are identifiable in most cases. Search should be made for the traces of abnormal pelvic structures on plain-film studies. Once the normal is recognized, any variations are easily identified. The fundamental differences between various radiologic densities —air, fat, fluid, muscle, calcium, bone and metal—should be observed. Special procedures can be used to enhance the contrasts after adequate evaluation of the simplest and, on many occasions, the invaluable, plain-film study of the soft tissues of the pelvis.*

NORMAL PELVIC STRUCTURES are plainly visible in most roentgenograms of good technical quality when the urinary bladder has been emptied immediately before the x-ray exposure. Roentgenograms of the pelvis obtained in the supine and lateral positions provide a baseline examination of the soft tissues. When indicated, erect, decubitus and contrast studies provide additional valuable diagnostic films.

Normal Pelvic Anatomy[1]

Ligaments. The sacrospinous and sacrotuberous ligaments join the sacrum and ischium. The sacrospinous ligament is thin and triangular and is attached to the spine of the ischium. It continues medially to the lateral margin of the sacrum and coccyx in front of the sacrotuberous ligament. The fibers of the two ligaments are intermingled as the sacrotuberous ligament proceeds from the lower and back part of the pelvis to the point of insertion. The site of this insertion is in the inner margin of the ischial tuberosity along the inner margin of the ramus. The latter is flat, triangular in form at each end, and narrow in the middle. The greater sciatic foramen is bordered by the sacrotuberous ligament behind and the sacrospinous ligament below. The sacrotuberous ligament behind and the sacrospinous ligament above, confine the lesser sciatic foramen. These ligaments, when bordered by pelvic fat, are visible on roentgenograms as symmetrical densities.

Muscles. Two main muscle groups are identified, the true pelvic muscles and those of the legs. The true pelvic musculature that forms the pelvic diaphragm are the levator ani and the coccygeus. The obturator internus and the piriformis are muscles of the lower extremities. The piriformis leaves the pelvis by means of the greater sciatic foramen and

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the tendon of the obturator internus leaves by the lesser sciatic foramen. These muscle groups are seen in roentgenograms when outlined by pelvic fat.

Urinary Bladder. In the postvoiding state, soft-tissue density of the bladder is usually separated from the surrounding soft-tissues of the pelvis by adipose (relatively radiolucent) tissue. Otherwise, the shadows of the distended bladder preclude evaluation of other soft-tissue densities.

Miscellaneous. In females, the uterine shadow, when present, is usually definable, as are, on occasion, the adnexal structures. The rectal ampulla is usually empty of either air or fecal matter, whereas the rectosigmoid and sigmoid colon are usually a mottled soft-tissue density and may be misinterpreted as a significant soft-tissue mass, usually in the left adnexal area.

When these normal pelvic structures are seen, particularly those of the bladder in the postvoiding state, any other density of whatever nature usually constitutes a pathologic entity. Plain-film studies constitute a necessary prerequisite to any special procedure, such as contrast examination.

Densities of Pathologic Nature

Air. Occasionally air may be observed within the rectum or rectosigmoid, especially when cleansing enemas have been administered. Occasionally this air will delineate intrinsic colonic lesions. Air bubbles have been observed within colonic diverticula on plain-film study. They have also been seen within pelvic inflammatory masses and within the vaginal or uterine wall, or in both. When seen within the bladder wall and lumen in cystitis emphysematosus (Figure 3), underlying diabetes mellitus with a chronic refractory urinary infection is present in



Figure 1.*—Normal anatomic positions as observed roentgenographically. (1) Obturator internus, (2) levator ani, (3) bladder, (4) uterus, (5) adnexa, (6) sacrospinous ligament.



Figure 2.*—Plain film showing normal soft-tissue pelvic structure in a female.

*Figures 1, 2 and 7 appear in Noonan, C. D.: Plain-film diagnosis of acute gynecologic disorders and obstetric complications, 2:167-181, April, 1964. Courtesy, Radiologic Clinics of North America.

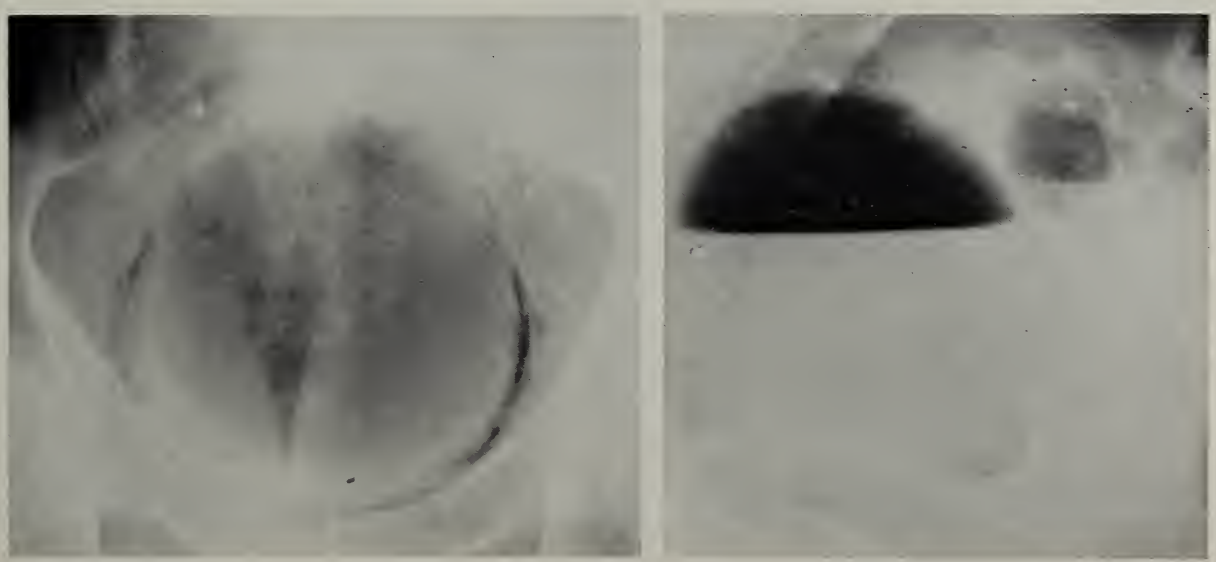


Figure 3.—Film showing cystitis emphysematosus. Left lateral decubitus view shows elevation of air-fluid level.

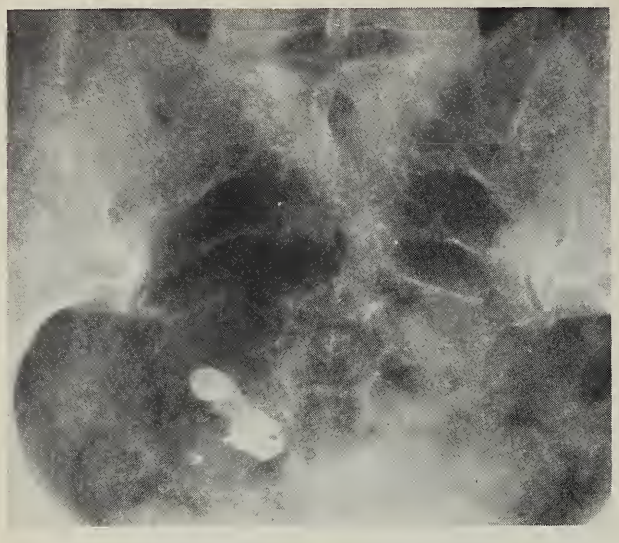


Figure 4.—Film showing ovarian teratoma.

most cases. Common organisms are *E. coli* and aero-aerogens. Glycosuria with fermentation that produces gas may lead to a false low blood sugar and be followed by a cycle of poor control, glycosuria and further infection. Otherwise, pneumaturia *per se* may indicate an intestinal fistula or previous instrumentation. The colonic wall in pneumatosis cystoides intestinalis contains these air bubbles. The cause of pneumatosis cystoides intestinalis is unknown. It has been observed in such conditions as chronic lung disease associated with emphysema, for example, scleroderma; obstructive lesions of the bowel, such as pyloric stenosis in the infant; secondary to surgical instrumentation, for example, sigmoidoscopy with or without biopsy; and Whipple's disease. It may be the cause of pneumoperitoneum.

Fat. Compared with pelvic muscle mass and the usual fluid-filled or solid structures, densities of pelvic fat are relatively radiolucent. Ovarian teratoma is the soft-tissue mass of the pelvis commonly clearly delineated by fat and abortive tooth formation (Figure 4). Usually, the areolar, fatty, soft-tissue pelvic planes are obliterated when inflammatory disease and extreme amounts of abdominal fluid are present.

Fluid or Mass, or Both. Abdominal fluid will resemble a pelvic mass in roentgenograms obtained in the supine position and characteristically will change or disappear with changes in position at the time of roentgenographic exposure. Characteristically, abdominal fluid gravitates into the pelvis, displacing any air-containing bowel from the pelvis. In the abdomen, the bowel is separated from the peritoneal fat lines, which are in continuity with the pelvic fascial fat planes. Small amounts of fluid easily escape detection and extreme amounts of peritoneal fluid usually will obliterate the fatty pelvic planes. The contour and position of either cystic or solid pelvic masses remain unchanged unless the tumors are attached by a long pedicle, or are of a fatty nature. They are identifiable by displacement of adjoining air-fluid structures or fluid-filled or solid viscera. Since, in the female pelvis, masses may be associated with abdominal fluid, evidence of both mass and fluid should be sought. Phlebolith densities that have become displaced after earlier studies of the pelvic tissues indicate that a pelvic mass has appeared in the

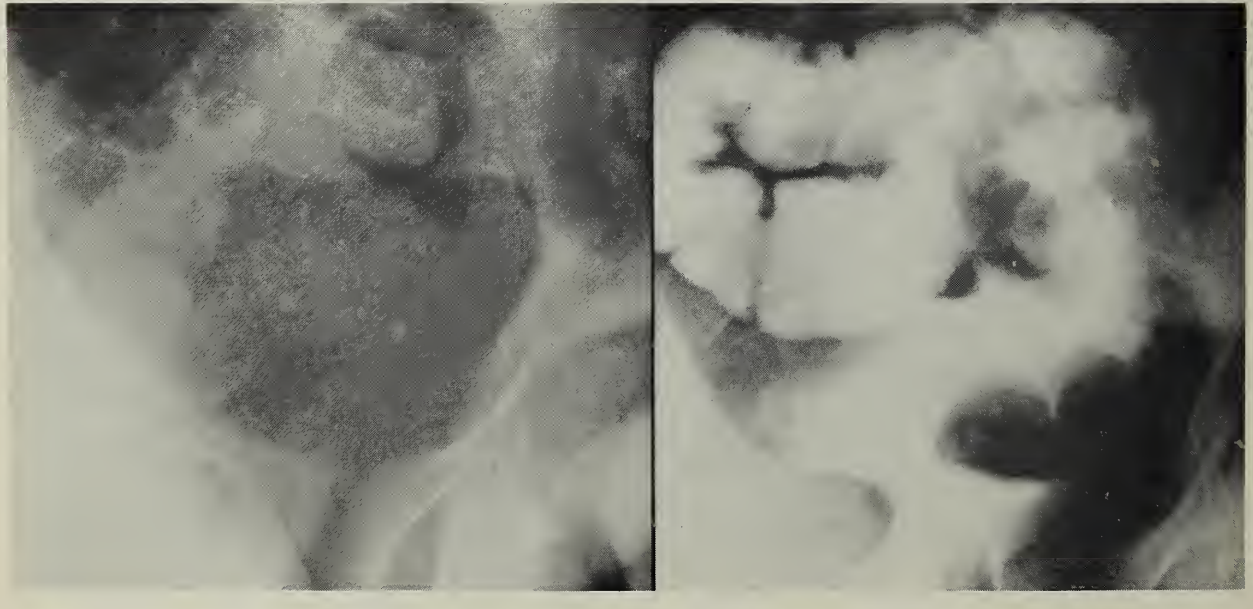


Figure 5.—Roentgen views of hemangiomata of the colon. The intramural colonic masses contain phleboliths.

interval. Fluid within the hip joint may account for an apparent disproportionate increase in muscle mass bordering the pelvis on the affected side (that is, obturator internus).

Calcifications.[2] Spherical phlebolith calcifications with their radiolucent centers rarely are, *per se*, of significant or pathologic importance. Occasionally, when present within a mass, they indicate a definitive diagnosis of hemangioma (Figure 5). Change in phlebolith position may herald an otherwise undetected pelvic mass. Amorphous calcification occurs within well circumscribed areas of uterine fibromas and in 10 per cent of ovarian fibromas. It is also deposited throughout all layers of the wall of a tuberculous bladder. Asymmetric tubular calcification is rarely observed in associated ureteral involvement. Tuberculous cystitis is noted within the mass of the contracted bladder, whereas plaque-like, thin vesical calcification and symmetric, tubular, ureteral calcification has been described in schistosomiasis hematobium. Rarely is calcification of the seminal vesical observed in tuberculosis.

Degenerative calcification of the ductus deferens is common and is located in the middle muscular layer. Seventy per cent of patients with ductus deferens calcification (Figure 6) have diabetes mellitus, whereas of all male diabetics, 11 per cent have this sign. In females the counterpart of this calcification is tubular calcification related to the fallopian tubes. Ureteral calculi are usually at the ureterovesical junction above the interspinous plane, oriented in the plane of the ureter.

Fine, punctate pelvic calcifications (psammomas) are found in approximately 12 per cent of patients with papillary cystadenoma and papillary cystadenocarcinoma. Only rarely does the metastatic lesion manifest these calcifications, and the primary pelvic lesion remains grossly normal. Plaque-like or curvalinear calcifications are observed in other soft tissue masses of the pelvis. They are not uncommon with pseudomyxoma peritonei resulting from appendiceal mucocele or ovarian mucinous tumor. Calculi of appendiceal, tubal or bladder origin may be single, multiple, laminated or faceted.

Most important in pediatric pelvic studies is vesical calcification, which is often asymptomatic. It is found half as often as renal calculi and in a ratio of nine males to one female. Ligamentous calcification, particularly of the sacrotuberous ligaments, has been observed in fluoride poisoning and it constitutes a hazard to successful labor during pregnancy.

Metal. Pathologic densities of a metallic nature result from either ingestion or purposeful introduction. The most commonly used element is that in the barium enema examination, which assists in clearly delineating normal and pathologic pelvic anatomic structures. Introduction of barium into the rectal wall forms a barium granuloma. Another density is that caused by intrauterine pessary placed long previously and otherwise concealed on vaginal inspection by the cervix. Residual contrast media may be observed within the pelvic peritoneum secondary to hysterosalpingography, particularly when a medium with an oily base has been used.



Figure 6.—Film shows ductus deferens calcification. Tubular oblique calcium deposits are above the shadow of the bladder.

Pelvic Gynecography[3]

The soft-tissues of the pelvis are particularly suited for additional examination with contrast medium. Various studies, including those of the colon, pyelography, cystography, pneumoperitoneography, angiography and, more recently, celiography, aid in clearly defining the extent and usually the nature of pelvic pathologic processes. Before these studies a preliminary plain-film examination is needed to serve as a baseline in analyzing the findings on contrast radiography.

Pelvic gynecography[3] emphasizes the current resurgence in diagnostic evaluation of roentgenograms of pelvic tissues.

Method and Complications. After colonic cleansing and micturition, preliminary plain-film studies are obtained. Approximately 1,500 ml of nitrous oxide is introduced into the peritoneal cavity of the patient, usually through an upper abdominal opening distant from solid viscus and abdominal scars. Nitrous oxide is an agent of choice because it is soluble in the blood, avoids air emboli and is relatively stable. The author has accidentally introduced nitrous oxide into the abdominal wall and retroperitoneal space without untoward reaction.

After the anesthetic has been administered and the needle removed, the patient is placed in a prone position and the foot of the table inclined to 45°. The patient is asked to assume the knee-chest position in order to displace any bowel confined to the pelvis. Otherwise, air, carbon dioxide, nitrous oxide

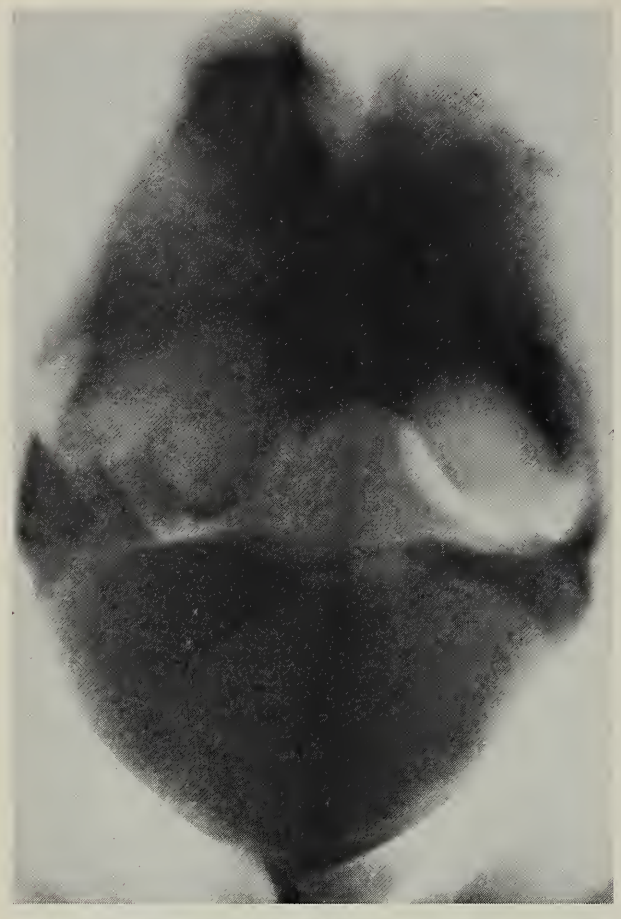


Figure 7.*—Gynecogram showing polycystic ovaries. The area of each ovary approximates that of the uterine fundus.

and/or contrast medium may be introduced into the colon in order to identify colonic structures. Usually the x-ray beam is directed perpendicularly to the floor, through the patient's pelvis, and the exposure then made. Details of the uterine ligaments and of the adnexal and pelvic wall are easily evaluated by this method. The direction of the x-ray beam and the position of the patient may be varied in the individual case.

Diaphragmatic irritation (referred as shoulder pain) or distention or bloating of the abdomen are not uncommon during and after the procedure. As most of the pneumoperitoneum is resorbed within two hours, the patient need not be kept in hospital. Local discomfort is indicative of improper placement of contrast material during examination. Subjective bloating with loss of percussive dullness over the liver, and complaint of shoulder discomfort in some cases, indicate proper placement. Hysterosalpingograms have been combined with these studies, but rarely are a necessary adjunct.

Indications for Gynecography and Interpretation of Roentgenograms. The prime value of gynecography is its clear indisputable identification of normal and pathologic states in the pelvis, especially in obese patients in whom bimanual examination is controversial and the preoperative or postoperative state unknown. In children, the confirmation of a uterine mass and adnexal structures is possible. Polycystic ovaries may indicate the Stein-Leventhal syndrome if hirsutism without virilization and menstrual irregularities (usually oligomenorrhea or amenorrhea) have been noted. Hirsutism in this syndrome is present in about half the patients and uterine hypoplasia in about three-fourths of them. The polycystic ovary approximates at least three-fourths of the uterine fundus, whereas the normal ovary seldom occupies more than half or less than one-quarter. In Figures 7 and 8 the gynecograms contrast the appearance of a normal pelvis with that of a Stein-Leventhal syndrome. Surgical procedures confirmed each.

*Figures 1, 2 and 7 appear in Noonan, C. D.: Plain-film diagnosis of acute gynecologic disorders and obstetric complications, 2:167-181, April, 1964. Courtesy, Radiologic Clinics of North America.



Figure 8.—Gynecogram of normal uterus and adnexa.

Pneumoperitoneum has been recommended for evaluation of pelvic structures since 1918, and with Stein's description of the polycystic ovary in 1935, the radiologist should be prepared to evaluate pelvic gynecograms. Adnexal or uterine masses of all kinds, as well as pelvic adhesions, become readily visible when outlined by contrast material.

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REFERENCES

1. Levene, G., and Kaufman, S. A.: The diagnostic significance of roentgenologic soft tissue shadows in the pelvis, Am. J. Roentg., 79:697, April, 1958.

2. McAfee, J. B., and Donner, M. W.: Differential diagnosis of calcifications encountered in abdominal radiographs, Am. J. Med. Sci., 243:609, May, 1962.

3. Shulz, E., and Rosen, S. W.: Gynecography; technique and interpretation, Am. J. Roentg., 86:866, November, 1961.

Surprise Realistic Mock Disasters

The Most Effective Means of Disaster Training

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■ *Realism introduced in several large scale surprise mock-disaster tests proved to be a real challenge to a disaster-conscious hospital staff that had previously undergone fairly extensive disaster training and testing, utilizing conventional methods.*

Serious weaknesses, flaws, omissions and deficiencies in disaster capability were dramatically and conclusively revealed by use of what appeared to be a "live" disaster setting with smoke, fire, explosions; adverse weather and light conditions; realistically-simulated "casualties" especially prepared not only to look *but to act the part; selected harassment incidents from well-documented disasters, such as utility failures, automobile accident on the main access route, overload of telephone switchboard, and invasion of hospital and disaster site by distraught relatives and the morbidly curious.*

DESPITE MAN'S greatest breakthroughs in the scientific knowledge, he still remains helpless before the titanic quirks of nature—earthquakes, hurricanes, tornados and floods. Even more ironic is his inability to prevent or control man-made catastrophes such as fires, explosions, train wrecks, plane crashes, and now nuclear blasts. While nuclear blasts cannot be discounted as a potential source of future disasters, thousands of lives continue to be lost daily in "garden variety" of disasters, all too well known to anyone who reads, listens or views.

Increasing emphasis has been placed in recent years on the necessity of community planning for potential disasters. The advent of the nuclear age has given considerable impetus to preparing and training for such events not only in the Armed Forces but in civilian communities. Unfortunately, for the most part, preparation has been limited to planning—to drafting a master plan with many ap-

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Terrified mother (in mock scene) holding unconscious son with open fracture of skull, pleads for help. Monitors in background to prevent possible accidents from bystanders entering burning aircraft.



Realistic "casualties" in make-up area, immediately before they were transported to disaster site.



Last-minute "touch-up" by cosmeticians at disaster site to insure realistic simulation of acute trauma.

pendices—which is subsequently filed in some cabinet or safe.

It is the purpose of this paper to point out that while planning and training can more easily be facilitated by lectures, pamphlets and a demonstration of walk-through type, the most effective means of instruction and improvement is the use of surprise, realistic disaster exercises.

Experience at Travis Air Force Base

Our experience with disaster planning and training at the USAF Hospital Travis began in the spring of 1959 when special 40-hour training courses in disaster medical care were initiated for all medical and paramedical personnel.

A formal hospital plan for disaster was conceived, published and tested by two practical test disaster exercises in 1959 and three exercises in 1960. Overall performance on each occasion was fairly satisfactory.

In retrospect, it is highly significant that these exercises had all been held in an orthodox manner: In general, they were conducted during pleasant weather, on a dry, grassy field, or concrete runway, utilizing "tags" which listed nature and extent of injuries on disinterested, quietly lying uncoached "casualties," without harassment of any kind or failure of any hospital utilities.

The disaster problem solely concerned a theoretical situation in which medical personnel were concerned with medical problems alone, without simultaneous test participation of any other disaster agency, ignoring completely the mutual problems which confront firefighters, medical personnel and air police in real disasters.

Operation "Roll Call," held on 27 January 1961, was the first realistic disaster exercise ever conducted at Travis.

This surprise test exercise was held in inclement weather, in the dark, after a week of rain, on a muddy field. The surprise presented a sham "Broken Arrow" aircraft disaster (i.e., nuclear weapon on board aircraft) which required participation of firefighters, air police, disaster control personnel and radiation detection, as well as the medical care and evacuation of casualties. The exercise included selected harassment incidents taken from well-documented past disasters, both military and civilian. A special feature of the test was the participation of one hundred realistically simulated "casualties," who not only looked the part but acted the part of various types of casualties.

A critique held after this exercise completely shattered the existing complacency regarding disaster readiness on the part of medical personnel. The entire plan for coping with disaster at the hospital was rewritten, with innumerable changes in concept and technique, primarily because of the flaws detected as a result of the realism introduced into the exercise.

At that time, there was little or no attempt on the part of other support agencies to examine into their own flaws and weaknesses which were only too obvious to those who had planned the exercise and participated in it.

Operation "Calamity Jane," held on 19 October 1961, was an even larger scale realistic disaster test exercise, deliberately planned to simultaneously test all agencies involved in disaster control in a military community.

With utmost secrecy, a special disaster exercise preparation team prepared in detail a test exercise which effectively probed the existing Base disaster control plan and hospital disaster plan for flaws and weaknesses that might emerge under less than optimal conditions.

Careful search was made of the records of real-life disasters that had been well-documented in the past, both in military and civilian communities (and there was voluminous material available). Incidents from various disasters were abstracted, modified, and fitted into "Calamity Jane."

The scenario of Operation "Calamity Jane" read as follows: "On 19 October 1961, a few seconds after midnight, a MATS civilian contract carrier with approximately 130 military personnel and dependents aboard, actually departed Travis for Clark Air Base in the Philippines. One minute after take-off, a series of explosions and fires was set off on a cold, dark, dusty knoll located 1.5 miles southeast of the end of the runway. The stage was dramatically set with the flaming hulk of an old C-97 fuselage, and the screams, moans and antics of 132 "casualties" realistically made up with fractures, burns, penetrating wounds of the abdomen and chest, head injuries and lacerations. These "casualties" previously coached very carefully, continued to "act out" their roles throughout the exercise.

A short distance from the flaming hulk lay an overturned gondola on a railroad siding, from which had spilled two mock-up nuclear weapons, and there was fire in the immediate vicinity. Hidden over an area approximately 30 yards in diameter surrounding the gondola were strips of heavy tarpaulin to which there had been fixed metallic radioactive devices that emitted radiation. Many patients were made radiation "casualties" by use of the same devices. Preplanned harassment incidents included a simulated automobile accident at the main entrance of the approach road leading to the disaster site; the arrival of the mayors of two nearby cities with their police chiefs, who frantically demanded information and guidance from the Base officer of the day; simulated panic at the air termi-

nal by a group of carefully coached "relatives" who had been seeing the passengers off; the setting off of a burglar alarm at the finance office; a 30-minute loss of electrical power at the hospital; jamming of the Base switchboard with telephone calls from relatives, newsmen and neighbors; and invasion of the hospital by distraught "relatives" seeking their loved ones.

Six senior line officers and six senior hospital commanders from other Air Force bases, together with three civilian general surgeons, formed a group of umpires carefully stationed at various sites to make pertinent observations. In addition, the WESTAF Commander, the 1501st Wing Commander, and key members of their staffs were official observers.

A wing-base critique, held several days after the exercise, pointed out the following defects and deficiencies observed during the exercise:

- Lack of command post at the disaster site proper, with resulting lack of coordination of essential rescue activities.
- Weak communication facilities at the disaster site, with consequent inability of different support agencies to communicate with each other, or to receive instructions simultaneously from a field commander if one had been present.
- Poor traffic control, with serious hold-up of rescue vehicles, resulting from ineffective handling of an accident situation, poor traffic handling on the approach road, and failure to post guides at the disaster site.
- Failure to supply security for the hospital, with consequent interference in medical care by unauthorized intruders.
- Poor lighting at disaster site, which seriously hampered effective emergency first aid.

It was stressed that the provision of nontechnical labor was a command function, and that mass casualties demanded the maximum conservation of medical effort, interdicting the use of medical personnel for litter-bearing and other labor functions.

Following the critique, appropriate changes in concept and procedure were again introduced into the Base disaster plan, and considerable communication and other specialized disaster equipment was ordered.

Civilian Disaster Experiences

In the March 1962 *Journal of Trauma*, Dr. Gerald W. Shaftan published an article entitled "Disaster and Medical Care," relating the experiences of the Kings County Hospital Disaster Planning Committee in three major disasters that took place in New York City from December 1960 through January 1961. These included:

1. Two-plane collision in mid-air, separately crashing in Brooklyn and Staten Island—16 December 1960.
2. Major fire on carrier Constellation in Brooklyn Navy Yard trapping 250 men below deck—19 December 1960.
3. Mexican airline plane crashed on take-off at New York International Airport. (Same day as parade for Lieutenant Colonel John Glenn.)

Dr. Shaftan commented repeatedly on the totally ineffective control and chaotic disaster scenes which resulted from absence of central disaster authority, lack of traffic control, ineffective communication and lack of organization of medical disaster resources. He concluded that in disaster situations "sensible action must depend on reflexes rather than reasoning." He strongly advocated the utilization of mock exercises and drills as the most effective means of instruction.

Conclusion

The realism introduced in several large-scale surprise mock disasters held in a fairly large military community proved to be a real challenge to a disaster-conscious hospital staff that had previously undergone fairly extensive training and testing, utilizing conventional methods. Serious weaknesses, flaws and oversights in disaster capability were dramatically and conclusively revealed primarily because of the realistically-simulated disaster phenomena (a real disaster problem, in a "live" disaster setting, with realistic mock-up "casualties" that not only looked but acted the part, harassment from utility failures, distraught relatives, telephone overloads, etc.).

The most effective means of disaster training, short of participation in actual real-life disasters, is the use of realistic mock exercises.

An analogy can and should be made between the preparation required for the achievement of a state of disaster readiness, and that required to achieve the proper level of combat capability for actual war. All the lectures, training films, instruction pamphlets, and carefully annotated plans in the world cannot teach a surgeon to perform an operation, a student pilot to fly an aircraft, a football team to play the game, or a community to achieve an effective state of disaster readiness.

As stated by senior officers who umpired the exercises, "One has only to witness the challenge of a realistically-conducted exercise, held under real adverse weather conditions and utilizing realistically-simulated casualties, with simultaneous test-participation of all support agencies to become a missionary to the cause of realistic disaster planning and training."

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ACID BASE DISORDERS

The Clinical Use of the Astrup Method of Determining pH, pCO_2 and Base Excess

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■ *The Astrup method for determination of arterial pH, pCO_2, and "base excess" provides a simple and accurate means for quantitation of acid-base disorders. The "base excess" value, a measure of metabolic acidosis or alkalosis, gives the clinician a valuable tool with which to estimate electrolyte replacement. The pCO_2 is a measure of respiratory acidosis or alkalosis. The pH is used as a measure of the adequacy of compensation. Several representative cases illustrate the use and interpretation of the test.*

THE INTRODUCTION of the flame photometer stimulated interest and reliance upon electrolyte determinations in acid-base disorders. It has become obvious that determinations of serum electrolytes alone do not give complete information and may be misleading. Frequently one cannot tell the difference between metabolic acidosis and respiratory alkalosis in a condition such as salicylate intoxication. The determination of whole blood pH, pCO_2 and base excess or deficit provides information not available from electrolyte determinations alone.

It is possible to quantitate, by the use of Astrup's nomogram,[1-7] the degree of metabolic and respiratory acidosis or alkalosis. The degree of base excess or deficit has important implications regarding the quantity and type of necessary electrolyte replacement. The complete acid-base profile can be obtained by the Astrup method in less time than it takes to perform the CO_2 combining power determination.

Since considerable confusion in terminology often arises in discussion of acid-base disorders, the terms should be defined.[3]

Acidemia: Lowering of blood pH below 7.35;

Alkalemia: Elevation of blood pH above 7.45;

Acidosis: A change in respiratory or metabolic status which, if not compensated, would cause an acidemia;

Alkalosis: A change in respiratory or metabolic status which, if not compensated, would cause an alkalemia.

From clinical laboratory, Providence Hospital, Portland, Oregon. Submitted March 16, 1964.

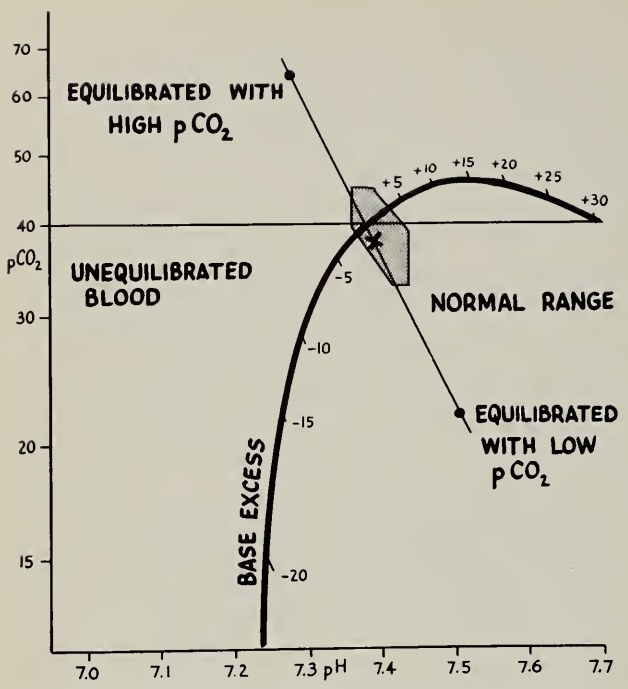


Chart 1.—Astrup nomogram. Points of equilibration of blood with known CO_2–O_2 gas mixtures define the line. The pH of the unequilibrated blood sample was 7.39. The pCO_2 read from the nomogram was 38 mm of mercury. The shaded polygon is the normal range.

Determination Method

For the Astrup method, whole blood obtained from an artery or arterialized capillary is used. It must be obtained anaerobically, and is kept at 4°C until the determination is carried out. The measurements are made on a temperature-controlled pH meter, described by Astrup,* which requires only 0.025 ml of blood and may be performed up to three hours after the blood is obtained.[6] Three pH measurements using whole blood are necessary. One reading is that of the unaltered blood as received from the patient. The other two readings are of blood equilibrated in a tonometer at 37°C with different CO_2–O_2 mixtures. The chosen CO_2 tensions are such that one is approximately 20 mm of mercury and the other approximately 60 mm of mercury. The former is lower and the latter higher than the normal blood tension. The two points are plotted on a pH vs log pCO_2 graph (Chart 1) and a straight line is drawn through the points.

The pH of the unequilibrated blood can be located on the line to give the patient's pCO_2. The slope of the line is related to the buffering capacity of the blood. A 45° angle is the line describing the Henderson-Hasselbalch equation applied to the bicarbonate-carbonic acid system. A steeper line indicates greater buffering.

The "base excess" is determined by reading the value at the intersection of the patient's pH vs log pCO_2 line and the "base excess" curve of the nomogram. The "base excess" was derived by Astrup by drawing the curve obtained by adding known amounts of acid or base to a normal blood sample.

*Astrup Ultra-micro apparatus, Radiometer model AME-1, The London Company, 3355 Edgecliff Terrace, Cleveland 11, Ohio.

Principles of Interpretation

Examination of the Astrup nomogram reveals that in almost every case there is both a respiratory and metabolic component. Each must be analyzed separately. A new definition of terms is now possible.

Respiratory acidosis: pCO_2 above 45 mm of mercury;

Respiratory alkalosis: pCO_2 below 35 mm of mercury;

Metabolic acidosis: "Base excess" below −3 mEq per liter;

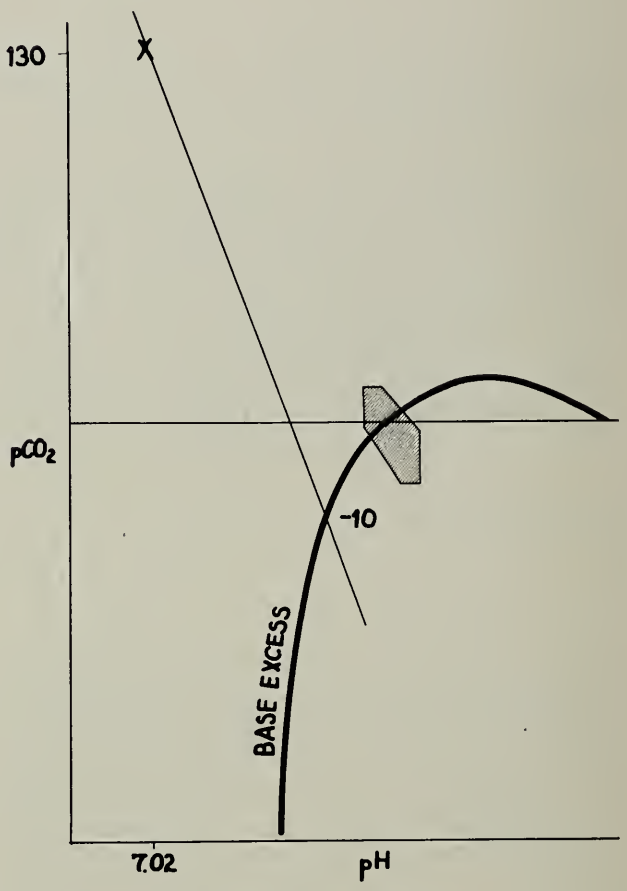


Chart 2.—Acute respiratory obstruction. A 7-year-old girl was operated on for a lacerated bronchus. During operation it was noted that her respirations were rapid but her color was poor. The very high pCO_2 of 130 mm of mercury and severe acidemia, pH 7.02, directed attention to the anesthesia airway, which contained too much dead space. Therapy consisted of shortening the airway. Serum electrolyte values during the acute episode were: CO_2 16 mEq per liter, Na 132 mEq per liter, K 3.8 mEq per liter, Cl 103 mEq per liter. The metabolic acidosis, "base excess" −10, may be explained by the trauma, preoperative starvation or dehydration.

Metabolic alkalosis: "Base excess" above +3 mEq per liter.

It must be borne in mind that knowledge of the patient's history is necessary for intelligent interpretation of a record. It is impossible to determine from the record alone which alterations are primary and which are a compensatory response. In a recent paper Schwartz and Relman[5] pointed out the difficulty in terminology which arises when one compares an alteration due to a primary condition with an alteration which is compensatory. The above definitions may also be modified when one acid-base derangement is superimposed upon another. The items which are important are:

(a) pCO_2, for presence and amount of the respiratory component;

(b) "Base excess," for presence and amount of of the metabolic component;

(c) pH, for adequacy of compensation.

Analysis of Cases

The usefulness of this test will become evident if representative cases of various disease states are analyzed.

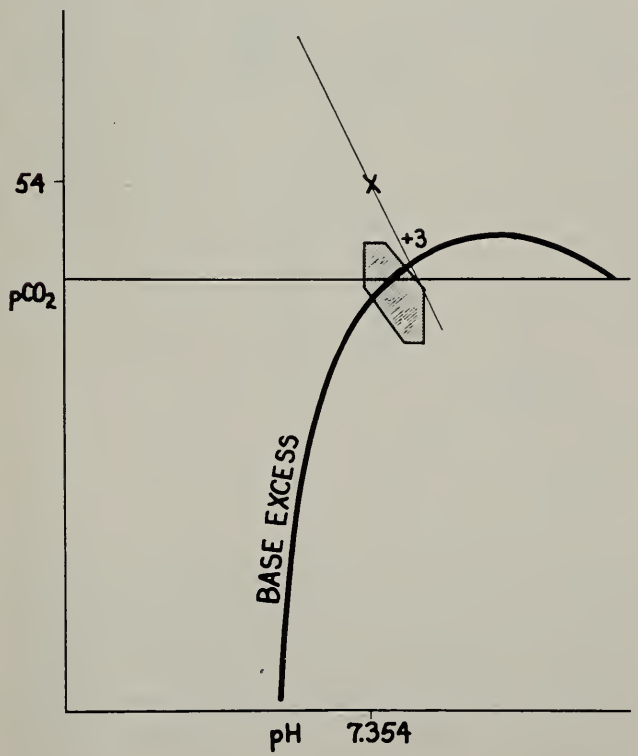


Chart 3.—Chronic respiratory acidosis. A 61-year-old man had silicosis and far advanced tuberculosis with episodes of dyspnea. At the time of the test, respirations were 20 per minute. The respiratory effort was great. The level of pCO_2 is typical of far advanced chronic pulmonary disease. One usually finds a slightly higher "base excess" in these cases.

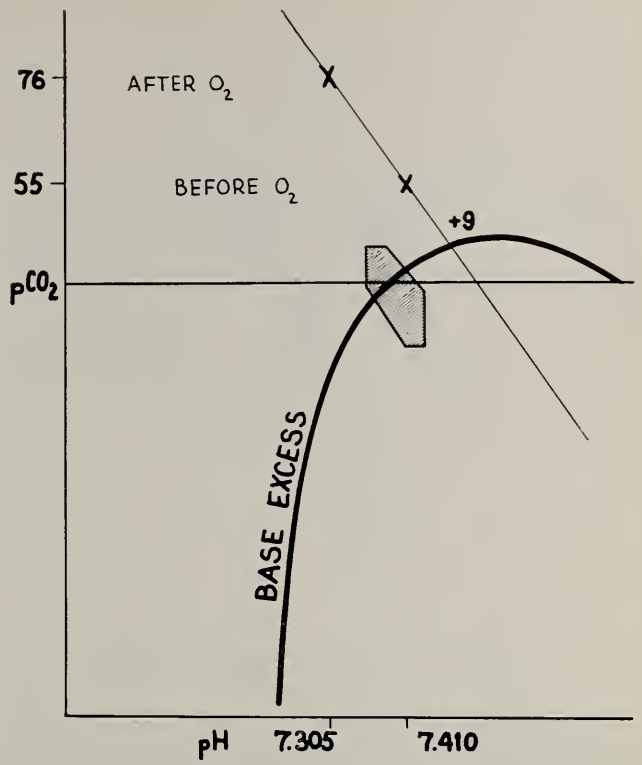


Chart 4.—CO_2 narcosis test. A patient with pneumoconiosis was tested for CO_2 narcosis. After breathing oxygen for 15 minutes there was an increase in the pCO_2 of 21 mm of mercury, which indicated that it would be dangerous for this patient to receive oxygen.

Respiratory Disease

Acute respiratory obstruction may cause very high pCO_2 values without appreciable metabolic compensation. The resulting acidemia may be extreme. Chart 2 illustrates such a case. After a period of a day some metabolic compensation can usually be seen.

In chronic respiratory disease, without an acute additional insult such as infection, the picture is different. All our records were made while the patient was awake and often strenuously hyperventilating. Had the record been made with the patient asleep, the pCO_2 might have been higher. In cases in which the degree of pulmonary disease was severe, the waking pCO_2 level was moderately elevated usually to between 50 and 60 mm of mercury. Chart 3 illustrates such a case. Sometimes the pCO_2 was normal or near normal, but the base excess was elevated to a moderate level of +4 to +7. The resulting blood pH was in the normal or slightly alkalemic range.[4] Apparently, there was some metabolic over-compensation.

CO_2 Narcosis Test

Patients with pulmonary disease are often considered for oxygen therapy to relieve symptoms. Many of these patients are suffering from CO_2 narcosis, and their respiratory center is no longer

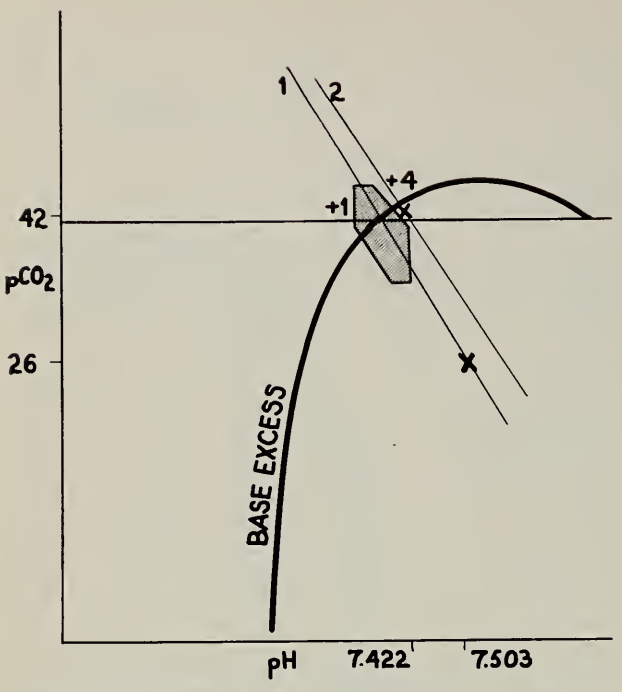


Chart 5.—Hyperventilation with respiratory alkalosis. A 35-year-old man was hyperpneic following evacuation of an epidural hematoma. The respiratory rate was 38 per minute. The anesthetist added 150 ml of dead space to the airway. A second determination was performed the following day when the respiratory rate was 24 per minute. Day 1: pCO_2, 26 mm of mercury; base excess, +1 mEq per liter; pH, 7.503. Day 2: pCO_2, 42 mm of mercury; base excess, +4 mEq per liter; pH, 7.422.

sensitive to the pCO_2. The sole respiratory stimulus is therefore hypoxia. Relieving hypoxia depresses respiration and may result in apnea. As a test for CO_2 narcosis, the following procedure was devised. An ordinary Astrup determination is performed. The patient, under close observation by the physician, is given oxygen to breathe by mask or nasal catheter. At the end of 15 minutes a second determination is performed. Since no shift in base excess should occur, a shortcut can be taken. The test can be performed by making a baseline measurement in the usual way and then measuring only the pH of the blood after breathing oxygen. The second point is located on the original pH vs pCO_2 graph. A rise in pCO_2 indicates that the respiratory center is responsive to hypoxia, but not pCO_2. Administration of oxygen would therefore be dangerous. Chart 4 illustrates the use of the test.

Hyperventilation with Respiratory Alkalosis

On occasion Astrup determinations have been performed on a patient because of dyspnea. Usually, the clinician suspects CO_2 retention, and is considering use of a respirator or performing tracheotomy. The case illustrated in Chart 5 is one such problem. The hyperventilation, of short duration, was due to central nervous system trauma. The pCO_2 was lowered and the blood pH elevated. The normal "base excess" indicates a lack of metabolic compensation. These acutely alkalemic patients frequently demonstrate a very low potassium level.

Metabolic Acidosis

The metabolic compensation for a primary pulmonary disorder develops slowly, while respiratory compensation of metabolic disorders occurs rapidly. Patients with metabolic acidosis have a "base excess" less than zero (minus "base excess"). In most cases there is a compensatory respiratory alkalosis (pCO_2 less than 40). Chart 6 illustrates a case of severe metabolic acidosis with extreme acidemia. Note the elevated serum potassium level, frequently seen in severe acidemia.

Metabolic Alkalosis

The diagnostic feature seen in metabolic alkalosis is an elevated "base excess." Potassium depletion and metabolic alkalosis frequently occur together. As a general rule, when the "base excess" is above +10, one should consider potassium replacement.

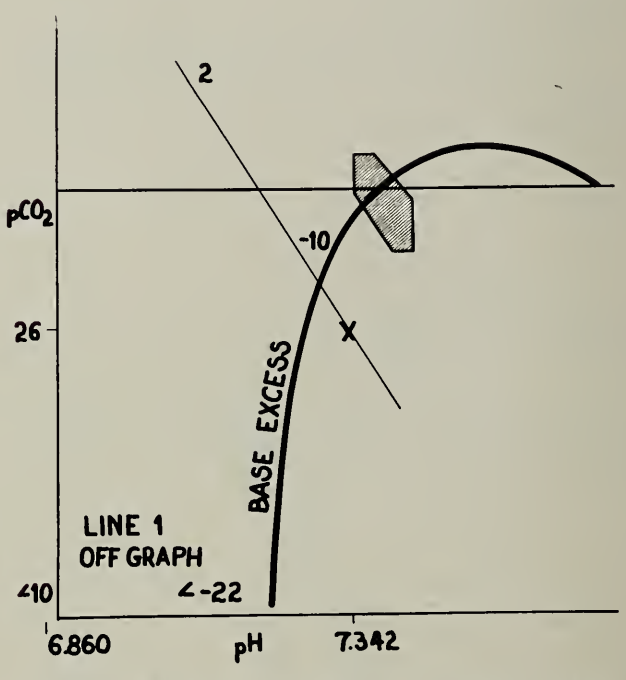


Chart 6.—Metabolic acidosis. An 8-week-old infant weighing 4.3 kg had diarrhea for one week. She entered the hospital dehydrated and hyperpneic. The initial values, line 1, are off the graph. Electrolyte replacement therapy consisted of 28 mEq of $NaHCO_3$ in the first 24 hours. In calculating the quantity of $NaHCO_3$ to be given, a normal extracellular volume of 300 ml per kg was assumed. Line 2 represents the values found 24 hours after the institution of therapy. CO_2 was determined by a titrametric method. Test values were:

Day	Time	(mEq) pCO_2	BE*	pH	(mEq per Liter) CO_2	Na	K	Cl
1	4 p.m.	<10	<−22	6.860	−5	136	8	124
	9 p.m.	..	..		13	144	4.8	...
2	8 a.m.	..	..		15	135	4.5	112
	4 p.m.	26	−10	7.342	..	...	..	...

*BE=Base excess.

The serum potassium level is not a reliable guide because it is related to the blood pH. Chart 7 illustrates a case of severe metabolic alkalosis. Frequently, there is a history of loss of fluid from the upper gastrointestinal tract or of steroid therapy.

Complex Problems

There are cases in which more than one primary process is at work. One such example is seen in aspirin poisoning (Chart 8). Early in the toxic state there is respiratory alkalosis followed by primary metabolic acidosis. Therapy depends upon the phase of the condition.

Discussion

The Astrup method for investigating problems of electrolyte imbalance clarifies difficult situations by separating and quantitating the metabolic and respiratory components. Each must be taken into consideration in order to institute appropriate therapy.

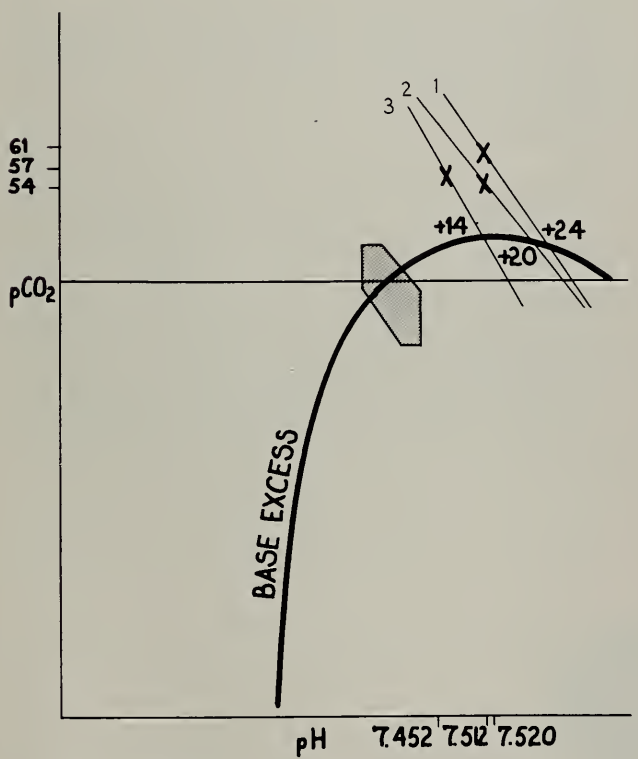


Chart 7.—Metabolic alkalosis. A 5-month-old boy with a neurological disease associated with arthrogryposis had pneumonia and persistent severe vomiting. He was dehydrated and weighed 4 kg. The Astrup test showed a decidedly elevated "base excess" and a partially compensating retention of CO_2. During the first 24 hours he received 650 ml of one-fourth normal saline plus 13 mEq KCl were given. Additional potassium was given following the final record. Test values were:

Day	(mEq) pCO_2	BE*	pH	(mEq per Liter) CO_2	Na	K	Cl
1	61	+24	7.520	..	...	..	73
2	54	+20	7.512	41	131	3.6	78
3	57	+14	7.452	..	128	4.4	82

*BE=Base excess.

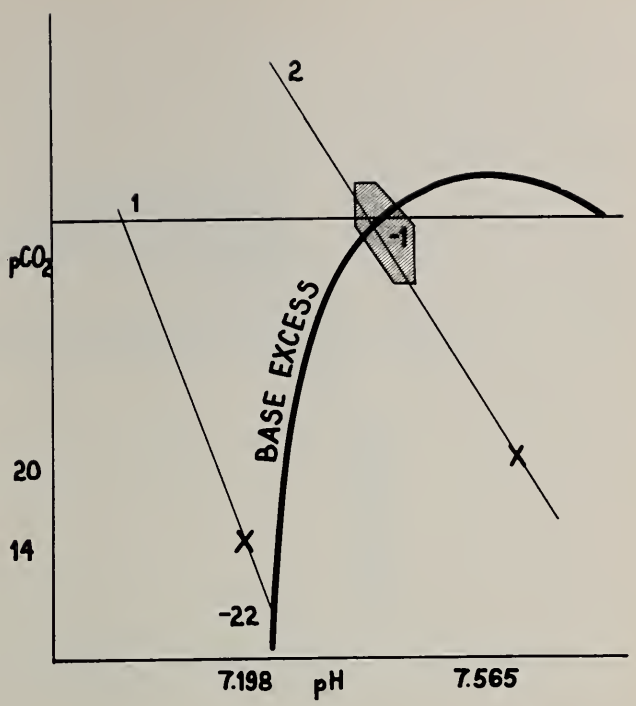


Chart 8.—Salicylate intoxication. A 5-year-old child was seen a few hours following ingestion of 13 aspirin tablets. Therapy consisted of 50 mEq sodium lactate. The acidifying effects of the aspirin were completely reversed by lactate therapy, although the central nervous stimulation continued. Laboratory test results were:

Day	(mEq) pCO_2	BE*	pH	(mEq) CO_2	Urine pH	(mg per 100 ml) Serum Salicylate
1	14	−22	7.198	10	5	58
2	20	−1	7.565	19.5	5.5	33

*BE=Base excess.

There are several possible sources of error which must be kept in mind in interpreting the test results. Respiratory changes occur rapidly. Either unusual hyperpnia or breath-holding by the patient will be reflected in the test results. An example of this (Chart 9) was provided by a subject who held his breath for 30 seconds. The resultant pCO_2 was 53 mm of mercury, and the pH was 7.360. The subject then hyperventilated for 30 seconds, driving the pCO_2 to 28 mm of mercury and the blood pH to 7.550. A similar situation is seen in some of the patients with chronic lung disease who have a normal pCO_2 at the time of examination. The only abnormality is an elevated "base excess," which indicates metabolic compensation for prolonged respiratory acidosis. A probable explanation of the discrepancy is hyperpnia on the part of the patient when the blood is drawn. A second source of error can be changes in the specimen after the blood is drawn. Refrigeration and the exclusion of air can minimize these changes.[6]

Electrolyte therapy should be based upon the "base excess" value. This indicates the quantity of

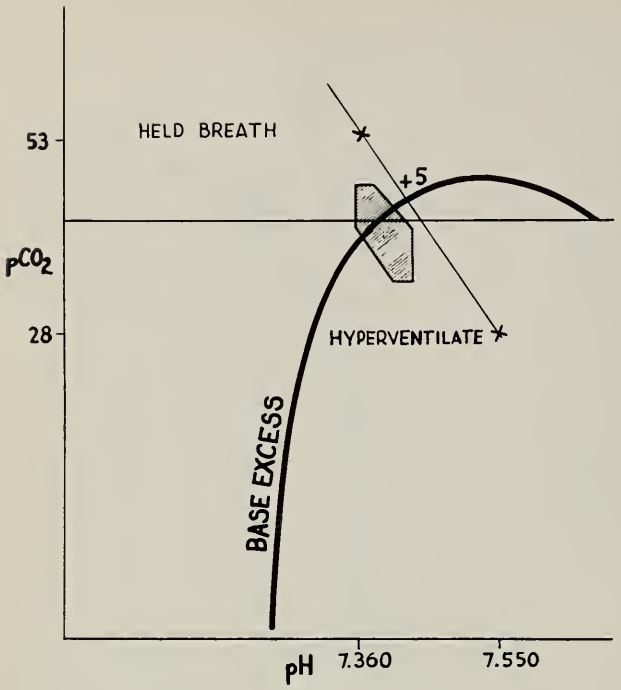


Chart 9.—Respiratory effects. A normal subject held his breath for 30 seconds. His pH was then 7.360 and his pCO_2 was 53 mm of mercury. After hyperventilating for 30 seconds his pH rose to 7.550 and his pCO_2 fell to 28 mm of mercury. The "base excess" of +5 mEq per liter reflects the normal postprandial metabolic alkalosis. A determination performed 3 hours later, just before lunch, showed a "base excess" of −2 mEq per liter.

fixed acid or base in the blood compared to the normal. It gives a good guide to the degree and direction of the metabolic acidosis or alkalosis. Astrup[6] recommended that electrolyte deficits in the extra cellular space be calculated using the formula:

Total deficit mEq =
"Base excess" × 0.3 × body wt Kg

The figure 0.3 approximates the extracellular fluid volume expressed in liters per kilogram of body weight for the normal adult male. This amount of the proper electrolytes should be given in an infusion, and repeat determinations should be performed before additional therapy is given.

The advantages of the Astrup system are its technical simplicity and speed and the ability to graphically clarify complex chemical relationships. The results of this test can serve only as a guide to therapy. In using the system one must always consider the patient's history, and the usual physiological patterns of compensation of acid-base disorders.

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REFERENCES

1. Astrup, P.: A new approach to acid-base metabolism, Clin. Chem., 7:1, 1961.

2. Astrup, P.: Jorgensen, K., Siggaard Anderson, O., Engel, K.: The acid-base metabolism, a new approach, The Lancet, 1:1035, 1960.

3. Creese, R., Ledingham, J. M., Neil, M. W., Vere, D. W.: The terminology of acid-base regulation, The Lancet, 1:419, 1962.

4. Robin, E.: Abnormalities of acid-base regulation in chronic pulmonary disease, with special reference to hypercapnia and extracellular alkalosis, N.E.J.M., 268:917, 1963.

5. Schwartz, W. B., Relman, A. S.: A critique of the parameters used in the evaluation of acid-base disorders, N.E.J.M., 268:1382, 1963.

6. Siggaard Anderson, O.: Sampling and storing of blood for determination of acid-base status, Scandinav. J. Clin. & Lab Investigation, 13:196, 1961.

7. Siggaard Anderson, O., Engel, K.: A new acid-base nomogram, Scandinav. J. Clin. & Lab Investigation, 12:177, 1960.



Diverticulitis With Sigmoidovesical Fistulae

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■ *In four cases of sigmoidovesical fistula secondary to sigmoid diverticulitis, the diagnosis was made by the findings of pneumaturia and fecaluria. The fistula was visualized in the bladder in two cases. A one-stage operative procedure was used for treating the condition. The patients recovered promptly with no morbidity.*

As the concept of the treatment of sigmoid diverticulitis has changed in the past few years, the concept of the treatment of its complications also has changed. This is particularly true of the complication of colovesical fistulae. Of all of the complications of sigmoid diverticulitis, perhaps the formation of a fistulous tract between the colon and the urinary bladder is the most serious, for usually it will result in profound infection of the urinary tract.

In the past the management of this complication has taken many diverse directions,[1,2,4] but since the advent of antibiotics and the use of neomycin-nystatin compounds by mouth for intestinal antisepsis, the usual case has now become relatively easy and simple to treat. Since the abscess has drained through the bladder, one does not find the large chronically abscessed inflammatory mass so often encountered in the perforated diverticulum that is not drained. Also antibiotics appear to be much more effective, as they are in treatment of any abscess after drainage has been established. In the past two years I have treated four patients as outlined below.

There were three women and a man in the age range 47 to 72 years. Each had had repeated attacks of diverticulitis before a fistula had formed. Diverticulosis had been previously diagnosed by barium enema. Dysuria was a complaint common to all. The diagnosis was confirmed in each instance by the findings of feces and gas in the urine. Complete urological surveys were done in all cases and all showed chronic cystitis. Pyelograms revealed no evidence of ureteral obstruction or hydronephrosis. The fistulae were visualized in two cases and feces were seen to extrude into the bladder in one.

In one woman the fistula appeared to close after the oral administration of a compound of neomycin and nystatin (Mycifradin-N) for intestinal antisepsis. However, the sigmoid colon was found still firmly attached to the posterior bladder wall at the time of resection. In all four cases evidence was noted at operation of previous pericolic abscess formation, the abscesses apparently having drained through the bladder.

Treatment

Three patients were treated by giving a preliminary course of broad spectrum antibiotics over a two-week period, followed four weeks later by a one-stage anterior partial colectomy with a complementary tube cecostomy. In each of these cases, after mechanical flushing of the bowel was carried out

Submitted May 11, 1964.

a neomycin-nystatin antibiotic was given over a 48-hour period before operation. In the fourth case a course of neomycin-nystatin by mouth was given for one week and the fistula then closed. Resection was done three months later, again after preparation of the bowel.

A suprapubic midline incision was made, and was carried upward as a left paramedian incision when necessary to release the splenic flexure. The sigmoid mass was dissected free from the bladder, and the opening in the bladder was closed with a single layer of interrupted No. 2-0 chromic sutures. If possible the peritoneum was approximated over this suture line with a continuous running suture of similar material. A catheter was left in the bladder for ten days following operation. The inflammatory mass together with the area of sigmoid and descending colon involved with diverticulosis was then resected and end-to-end open anastomosis was performed, using a mucosal suture of interrupted No. 2-0 chromic and a sero-muscular suture of interrupted No. 4-0 cotton. Appendectomy was performed and a No. 24, 5 cc Foley catheter was inserted through a stab wound in the anterior cecal wall. This was held in place by two inverting purse-string sutures of No. 2-0 chromic. The free end of the catheter was then brought from the abdomen through a stab wound in the right lower quadrant, approximating the cecum to the parietal peritoneum. The abdomen was then closed with a running suture of No. 2-0 chromic in the peritoneum and interrupted fine steel wire sutures in the deep fascia.

Postoperatively, antibiotics were given intravenously or orally for a period of five days. Further intestinal antisepsis was not attempted. Mechanical suction (Pratt) was maintained on the cecostomy tube until bowel movement was re-established. The cecostomy tube was then removed and the abdominal fistulae closed spontaneously in from two to five days. The patients walked on their second postoperative day. They were given only water by mouth on the first postoperative day and a soft diet thereafter. Nasogastric suction was not necessary in these cases, although it should be used if there is any tendency toward abdominal distention. Electrolyte and fluid balance was maintained intravenously for the first 24 to 48 hours and orally thereafter. All patients left the hospital by their 11th or 12th postoperative day, having normal bowel and bladder activity and all skin sutures removed. None had wound infection, abscess, fistula, stricture or other postoperative complications.

Comment

Vesical fistula formation is a not uncommon complication of sigmoid diverticulitis. Except in the unusual case in which there is a persistent large pelvic abscess or obstruction, treatment can now be carried out in a relatively safe and comparatively simple way. In place of the former three-stage procedures, a one-stage anterior resection with complementary tube cecostomy can be used. This has been made possible by the use of antibiotics and by oral administration of neomycin-nystatin for intestinal antisepsis.[3] The psychological effect of bearing with a colostomy for a period of three months or longer and its effect on morbidity can now be eliminated and the period in hospital and the cast can be greatly reduced.

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REFERENCES

1. Laufman, H., Silberman, W. W., and Paticha, S. M.: Surgical management of diverticulitis, Int. Abstr. Surg., 115:409-31, 1962. In: Surg., Gynec., Obstet. Collective Review, 115(5), 1962.

2. McSherry, C. K., and Beal, J. M.: Sigmoidovesical fistulae complicating diverticulitis, Arch. Surg., 85:1024, 1962.

3. Poth, E. M.: The role of intestinal antisepsis in preoperative preparation of the colon, Surgery, 47:1018, 1960.

4. Smith, O. F., and Rosen, R. S.: Colovesical fistula; complication of diverticulitis, Rhode Island M. J., 43:35, 1960.



Coronary Cineangiography

Clinical Studies for Evaluation In Equivocal Cases

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■ *Coronary cineangiography was helpful in the following circumstances:*

1. A patient with an abnormal electrocardiogram and no evidence of coronary artery disease.

2. A patient with thoracic pain in whom the diagnosis of coronary artery disease was questioned.

3. A patient with intractable angina pectoris who was being studied for possible surgical therapy.

4. A patient with coronary insufficiency and aortic stenosis who was being evaluated for operation on the aortic valve.

THERE has been increasing interest in the visualization of arteries to demonstrate occlusive disease. With the development of newer techniques, opacification of the coronary arteries has been accomplished with minimal morbidity and mortality and consistently satisfactory results.

We use the Sones technique[4] for coronary angiography, the major modification being that the catheter is inserted percutaneously into the axillary artery through a needle puncture.[1] A 6-inch image intensifier with a 35 mm camera capable of 60 frames per second is used for catheter placement and recording the image. Cineflor film developed in Eastman's rapid fix solution has proven satisfactory for film processing.

In the average patient, the right axillary artery is punctured under sterile conditions and local anesthesia in the lower axilla. A guide wire of Seldinger type (1 cm outside diameter) 135 cm long is inserted into the artery and maneuvered under fluoroscopic control into the ascending aorta. The guide wire may be made to pass obstacles and smaller blood vessels by maneuvering the patient's arm and neck. Once the tip of the guide wire is in the ascending aorta, the needle is taken off at the proximal end of the guide wire. A No. 7 Sones catheter is passed over the guide wire and down to the skin. Both guide wire and catheter are inserted through the skin and into the artery. Under fluoroscopic control, with an assistant slowly withdrawing the guide wire, the Sones catheter is made to pass over the wire into the ascending aorta. By teamwork, the tip of the Sones catheter is made to replace the tip of the guide wire in position in the ascending aorta.

The catheter is attached to the three-way stop-

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cock system of Sones. Once a coronary artery has been catheterized, 3 to 4 cc injections of 75 per cent Hypaque® are made while cinefluorography is being carried out. Care is taken that the catheter tip does not totally occlude a coronary artery. The pressure at the catheter tip is constantly monitored with a transducer. Sufficient numbers of angiograms are taken to visualize all vessels without overlap of images. This usually requires at least three views of the left and two of the right coronary artery. The total volume of contrast material used in the average patient for finding the individual coronary arteries and the angiography averages about 125 cc.

The purpose of this paper is to illustrate with case reports some of the clinical uses of coronary cineangiography.

Report of Cases

Case 1. The patient, a 27-year-old man, was first seen on October 18, 1963, because of nonspecific abnormalities in the T-wave noted on a routine electrocardiogram—inversion of the T-wave in leads 2, 3, AVF, and V-3 to V-6 unaltered by body position or hyperventilation. There was no history of cardiovascular disease or disability. In addition to his usual occupation, the patient was a semi-professional baseball player. Results of physical examination were within normal limits, as were blood cell count, urinalysis, protein-bound iodine and x-ray studies of the chest. The patient was walked on a treadmill at a 10 degree angle for ten minutes at four miles an hour, almost to the point of exhaustion, without distress in the chest or changes in the electrocardiogram change. However, the patient had been "rated up" for life insurance, restricted to sedentary activities, and told that playing baseball was hazardous for him. As a result he was somewhat anxious about himself. Therefore, coronary angiography was recommended. On November 14, 1963, coronary angiography revealed no evidence of occlusive disease. At last report the patient was playing baseball, was working at his job and was no longer apprehensive.

Discussion. We do not know the cause of the patient's abnormal electrocardiogram. Perhaps it is attributable to undiagnosed myocarditis in childhood. However, it is unwise to equate abnormalities in the electrocardiogram with coronary artery disease. In this case it was important from a personal and an economic standpoint to determine that the vascular tree was normal.

Case 2. The patient, a 42-year-old man, was well until about January 1962 when he noted the sudden onset of sharp pain in the left inframammary area radiating to the inner aspect of the left arm. It was non-pleuritic, not related to body position and was associated with increased sweating and dyspnea. The patient was put in hospital for four weeks with a diagnosis of acute myocardial infarction. He returned to his job, a sedentary one, in May, 1962. The pains became progressively worse, lasting two hours at a time, occurring almost daily. Although at first he noted some relief from the use of sublingual nitroglycerine, by mid-year this drug was no longer effective. He stopped working in October 1962 because of the severity of the pains. He was put in hospital for seven days in April 1963 and was again told that he had an infarct. First seen in consultation on August 13, 1963, the patient said the pains were never related to physical exertion. Commonly they followed emotional liability or a period of leaning over. Nausea, but not vomiting, infrequently accompanied the pain. The past history was non-contributory. There were no significant findings on physical examination. Results of all laboratory tests were within normal limits, including determination of cholesterol, fasting blood sugar, serum transaminase (SGOT), creatinine, urine catecholamines, serum calcium and protein-bound iodine. A resting electrocardiogram was normal. No abnormalities were brought on by exercise tests. An electrocardiogram taken during pain was within normal limits. The patient was exercised on a treadmill at a 10 degree angle at four miles per hour for six minutes without change in the electrocardiogram. Review of the old hospital records showed no evidence of myocardial infarction by electrocardiogram or laboratory tests. Because of the record of hospitalization and the diagnosis of coronary artery disease, concurred in by cardiac consultants, it was felt that visualization of the coronary arteries was needed. On August 29, 1963, a coronary angiogram showed normal coronary arteries. X-ray studies of the lower gastrointestinal tract, the gallbladder and the spine showed no abnormalities. Result of a provocative test for esophagitis with dilute hydrochloric acid was equivocal. An upper gastrointestinal series revealed a sliding hiatal hernia with antral gastritis. A medical regimen for hiatal hernia was prescribed, the patient was reassured about his heart and he returned to work with almost complete relief of symptoms.

Discussion. Coronary angiography was desirable in this case because of the diagnosis of coronary disease made in the past. Careful attention to details of the history may have led one to suspect the correct diagnosis.[2]

Case 3. A 48-year-old man gave a history of acute myocardial infarction in November 1957

with progressive intractable angina pectoris since that time. At the time of examination in September, 1963, the patient was taking 20 nitroglycerine tablets per day for substernal oppression, apparently precipitated by emotions, by minimal exertion such as walking across the room, and by assuming the recumbent position. He obtained relief from the nitroglycerine in 10 to 15 minutes. He was forced to stop working as a florist about September, 1963. With the resultant relative inactivity the pains were less frequent but still incapacitating. During the course of evaluation various agents for relief of the symptoms were given without any apparent effect. The only significant finding on physical examination was a grade III low pitched holosystolic murmur at the apex with axillary transmission. This murmur was thought not to have been present before the infarction. All laboratory tests including determination of protein-bound iodine were within normal limits as were roentgenograms of the stomach, colon, gallbladder and cervical and thoracic spine. Because of the apparent refractoriness of the angina pectoris, visualization of the coronary arteries was thought to be desirable to see if surgical operation might help. A coronary angiogram demonstrated diffuse coronary artery disease with multiple areas of narrowing. It was thought that the lesions were too extensive for surgical therapy.[3] At last report the patient was being treated with a beta adrenergic blocking agent with some benefit.

Discussion. The coronary angiogram in this patient established the presence and extent of occlusive disease and incidentally demonstrated the presence of mitral insufficiency (papillary muscle dysfunction perhaps). The condition was discussed with the patient and conservative methods of treatment were utilized.

Case 4. A 55-year-old woman had rheumatic fever at 8 years of age, known valvular disease at 13 and progressive dyspnea for three or four years before her first examination by the authors, in 1962. At that time, she had dyspnea upon walking across the room and had nocturnal dyspnea two to three times a week, without symptoms of dizziness or syncope. For two to three years, she had "pressing" pains in the anterior chest that occurred one or two times a day, usually precipitated by exertion such as walking five blocks on the level or doing housework, and commonly associated with nocturnal dyspnea. The pains often lasted one to two hours and were alleviated but not eliminated by taking nitroglycerine. Most of the pertinent physical findings were confined to the heart. The point of maximal impulse was 2 cm inside the left anterior axillary line. A systolic thrill was palpated over the aortic area. A grade VI low pitched, ejection systolic murmur was maximally audible over the aortic area and was transmitted over the entire precordium and posterior thorax. A grade III early diastolic blowing murmur was heard over the left precordium. The blood pressure was 124/70 mm of mercury. An electrocardiogram showed left ventricular hypertrophy and strain. X-ray films of the chest showed left ventricular enlargement and aortic valve calcifications. Further evaluation was thought to be necessary to see if the thoracic pain was caused by coronary artery disease, by involvement of the coronary ostia with the aortic stenosis or by a combination of these conditions. A coronary angiogram demonstrated patent coronary arteries with hypertrophy of both the right and circumflex branch of the left coronary arteries.

Discussion

In our experience with clinical-pathological correlations, the veracity of the angiograms has been excellent. From observation we have come to the belief that if there is no evidence of obstructive disease in these studies, the patient almost certainly has no clinical coronary artery disease. Conversely, it is possible to have thickening of the coronary arteries yet a normal angiogram, but we believe that these thickenings are not sufficient to cause clinical coronary artery disease. A normal angiogram is not equivalent to normal coronary arteries but would almost certainly eliminate suspicion of clinical coronary artery disease of a type to produce myocardial infarction.

Determining the status of the coronary arteries in patients with aortic stenosis and thoracic pain apparently due to coronary insufficiency is of more than academic interest. This information is of value in determining the desirability of operation on the aortic valve, in following progress of the patient through the surgical procedure and in anticipating changes in the clinical status postoperatively.

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REFERENCES

1. Hanafee, William: Axillary artery approach to carotid, vertebral, abdominal aorta, and coronary angiography, Radiology, 81:559-67, Oct. 1963.

2. Kalmansohn, Robert: Acute myocardial infarction. From Management of Medical Emergencies, edited by J. C. Sharpe, McGraw-Hill, New York, Toronto, London, 1961, 133-150.

3. Longmire, W. P. Jr., Cannon, J. A., and Kattus, Albert A.: Direct-vision coronary endarterectomy for angina pectoris, NEJM, 259:993-99, Nov. 20, 1958.

4. Sones, F. Mason Jr.: Cinecardioangiography. From Clinical Cardiopulmonary Physiology, edited by B. L. Gordon, Grune and Stratton, New York, 1960, 130-145.

A REVIEW

Lactic Acidosis

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LACTIC ACID, long recognized as an important product of normal metabolism,[42] was first associated with a metabolic acidosis by Barr, Himwich and Green in 1924.[9,10] These investigators recognized metabolic acidosis following strenuous physical exercise and linked it with the observed accumulation of blood lactic acid. They called the condition "lactic acid acidosis."

Following that report, sporadic references have been made to lactic acid as a demonstrated or suspected cause of metabolic acidosis in a variety of conditions. These have included the demonstrations of increased lactate accompanying the acidosis of diarrheal dehydration in infants,[23] anoxia,* muscular exercise,† hemorrhagic and endotoxin shock,‡ glycogen storage disease,[70,103] inadequate blood flow during cardio-pulmonary bypass procedure,[7,100] hyperthermia,[43] hyperventilation,[33,76,80] guanidine intoxication,[99] methyl alcohol poisoning,[13] salicylate intoxication,[36] nonketotic diabetic acidosis,[4,24,90,113] paraldehyde intoxication,[62] and feeding of lactic acid milk to infants.[52]

It was not until the introduction of the clinical concept of lactic acidosis by Huckabee, in 1961,[77,78] that it was recognized that severe metabolic acidosis related to the accumulation of large amounts of lactic acid in body water was of real clinical significance. Since Huckabee's initial report of nine patients with lactic acidosis, at least 62 additional cases have been reported.§ This presentation will concern itself with the entity of lactic acidosis, and will deal with current concepts of the mechanisms and control of lactate production and disposition, the clinical syndrome of lactic acidosis and the current concepts of pathogenesis, symptoms and therapy. No attempt has been made to include all possible references on these subjects and, where possible, previous reviews are cited.

For purposes of clarity in discussion, a definition of lactic acidosis is required. Lactic acidosis, chemically, is defined as a metabolic acidosis characterized by a significant reduction in arterial pH and the presence of a significant accumulation of lactate in extracellular fluids. As a practical consideration, lactic acid has rarely been shown to be responsible for a significant metabolic acidosis at blood levels of less than seven or eight millimols per liter. It is apparent that buffering mechanisms are capable of preventing clinically significant acidosis at blood lactate levels of less than this level. Exceptions to this are seen in the presence of pronounced respiratory or metabolic alkalosis in which very large amounts of lactate may accumulate without the development of a significant decrease of the pH.[72,77]

We have carefully refrained from inserting clinical considerations in the above definition of lactic acidosis. Such considerations serve as a means of differentiating the two major classes of lactic acidosis that have been recognized. Lactic acidosis which accompanies or results from well recognized clinical situations such as anoxia, severe anemia, shock, cardiac failure, severe exercise, severe pulmonary disease, or other clinical states known to result in significant decreases in tissue oxygenation or lactate utilization, may be conveniently labeled "secondary lactic acidosis." Huckabee was the first to identify a group of patients with lactic acidosis in whom the underlying disease process could not clearly be shown to have resulted in tissue anoxia.[78] Such cases have since been reported by

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*References Nos. 31, 46, 54, 74, 112.

†References Nos. 10, 45, 63, 80, 86, 106.

‡References Nos. 11, 20, 56, 87, 88, 96, 114, 115.

§References Nos. 14, 26, 39, 40, 53, 116, 128, 129, 130, 135.

a number of observers¶ and may be given the label "spontaneous lactic acidosis[135]" or "idiopathic lactic acidosis." Since the word *spontaneous* implies something of the mechanism of lactic acidosis which remains unknown, and the term *idiopathic* maintains a neutrality in our ignorance of the origins of this type of lactic acidosis, we prefer the latter term. Etiologic definition will lead to the extrication of lactic acidosis from the limbo of the "idiopathic" as our knowledge increases, and it may well prove not to be "spontaneous."

Lactic Acid Metabolism

Only one pathway of lactate production and utilization has been recognized, and there is no good evidence to suggest that a biologically significant alternate pathway exists in mammalian tissues. While a direct oxidizing enzyme, lactic oxidase, has been described in bacteria,[138] mammalian tissues oxidize lactate solely through the mediation of the enzyme lactic acid dehydrogenase (LDH) which catalyzes a reversible reaction which requires the participation of the pyridine nucleotide, coenzyme I (NAD, $NADH_2$, DPN, $DPNH_2$) as a hydrogen acceptor or donor:

Equation 1:

$$\text{Pyruvate} + NADH_2 \overset{\text{LDH}}{\longleftrightarrow} \text{Lactate} + NAD$$

The reaction has an equilibrium constant which favors the production of lactate at physiological pH. However, the direction of the reaction is controlled by the relative concentration of all of the reactants: Pyruvate, lactate, $NADH^-$, H^+, and NAD. Such an equilibrium may be conveniently expressed by the mass action form of equation.[1]

Equation 2:

$$[\text{Lactate}] = [\text{Pyruvate}] \times K\frac{[NADH^-]\,[H^+]}{[NAD]}$$

The enzyme LDH has been found in all tissues of the body and is located in the extramitochondrial, extramichrosomal cell sap.[16,17]

Since production and utilization of lactate occur over the same reversible pathway, and since this pathway is available in all mammalian tissues thus far examined, the concepts of lactate production and removal in the intact organism must involve the sum of the simultaneous individual rates and directions of reactions in individual tissues and organs. It was initially pointed out by Eggleton and Evans[34] and later confirmed directly and indirectly in experiments by Drury and Wick[30] and by Huckabee,[75] that formation and removal of lactate varies from tissue to tissue at any given moment, and that lactate may be produced by one group of tissues while it is simultaneously being utilized by other tissues.

The ability of various tissues to produce or utilize lactate varies considerably and is related to the intracellular oxidation-reduction state, the ratio of LDH concentration to the concentration of other enzymes utilizing NAD, intracellular pH, and the rate of accumulation of pyruvate, as governed by its production and utilization by pathways other than that of reduction to lactate.

Studies of the metabolism of lactate by intact tissues are difficult to interpret, because of the inevitable interference with circulation, oxygenation and normal metabolism by the procedures used in such studies. However, some observations have been made which shed some light on this problem.

Skeletal muscle tissue normally produces lactate at rest and increases its production very decidedly when actively contracting.* This is probably the major source of endogenous lactate production in the intact organism.[11] Cardiac muscle, by contrast, under normal aerobic conditions extracts lactate from blood.[21,32,56,68,76]

Adipose tissue normally produces small amounts of lactate, and this production is increased by stimulation with insulin, as is lactate production by skeletal muscle.[57,127,131]

Under normal conditions lactate is removed from portal blood by the liver†. This has been thought to be a very important role of the liver in maintaining normal blood lactate concentrations, and calculations have been made which suggest that the liver is normally responsible for the metabolism of about one-third of the lactate produced by the total organism.[34] The ability to dispose of a lactate load has been utilized as a test of hepatic function[15,18,101] and elevated levels of blood lactate have been observed in patients with liver disease.[15,18,101,121]

Studies by Drury and Wick demonstrated the ability of the extrahepatic tissues to remove considerable amounts of lactate in the hepatectomized-eviscerated preparation, but sharply elevated and increasing levels of blood lactate in their preparations would have altered normal equilibria in extrahepatic tissues.[30] It is possible that the anoxia of anesthesia and hypotension produced by the procedure may have been responsible for the very high lactate levels observed. In a series of experiments with an eviscerated preparation in which the liver was isolated from major vascular supply but not removed, Eggleton and Evans[33,34] and Russel, Long and Engel[114] were able to provide a prepara-

¶References Nos. 14, 26, 39, 40, 53, 116, 128, 129, 130, 135.

* References Nos. 34, 42, 68, 69, 102.

† References Nos. 3, 34, 64, 66-69, 76, 88, 101, 110, 114, 124, 126.

tion in which blood lactate elevations were minimal and did not increase during the procedure. This led to the conclusion that extrahepatic tissues were capable of utilizing large amounts of lactate.[34] However, there is no assurance that the liver may not have participated in some measure in the removal of lactate, since it remained in situ.

Renal tissue of the dog has been shown to remove lactate continuously and at a rate directly proportional to the level of lactate in renal arterial blood.[66,89] Erythrocytes produce lactate as the normal major end product of energy production and are responsible for a significant proportion of the endogenous lactate production at rest.* Little or no lactate flux has been demonstrated across the pulmonary circulation, and it would appear that this tissue does not contribute in a major way either to production or to removal of lactate.[33,34,59] Fetal tissue does not produce large amounts of lactate.[47]

It would appear that arterial lactate concentrations represent the sum total of events going on in all localities, assuming that cellular membranes are freely permeable to lactate and pyruvate. The evidence bearing on this question is incomplete, but studies of blood and tissue water lactate concentrations are fairly uniform in agreement that lactate equilibrates rapidly between intracellular and extracellular spaces and is governed by the considerations of the Donnan equilibrium as to its distribution across membranes.‡ The fact that there is not simultaneous equilibrium of lactate and pyruvate across cell membranes may account for some part of the disagreement in interpretation of the role of lactate and pyruvate ratios in blood as determinants of anaerobic metabolism and adequacy of perfusion and oxygenation.[34,93] Huckabee stressed the necessity for examination of arterial rather than venous lactate content when knowledge of whole body aerobic-anaerobic relationships is being sought.[72]

In light of these considerations it is apparent that the accumulation of a significant amount of lactate depends upon the development of a situation in which more lactate is being produced than removed. Such a situation might involve the production of very large amounts of lactate by a single region of the body (as in muscular exercise),§ by most tissues of the body (as in primary anoxia)¶ or by the inability to metabolize lactate produced at normal rates, as might be the case in the presence of liver disease[15,18,102,121] or pharmacological intoxication with agents specifically affecting the utilization of lactate.[8,36,62,133]

Recently acquired knowledge, reviewed by Dawson, Goodfriend and Kaplan,[28] indicates that mammalian lactic dehydrogenase exists as two distinct molecular forms. The two basic molecular forms have been labeled H (the form predominant in extracts of heart muscle) and M (the form predominant in skeletal muscle). The active enzyme units each consist of a total of four molecules of the enzyme and are patterned as one of five possible combinations: H_4, H_3M, H_2M_2, H_1M_3, M_4.

These would be merely items of incidental intelligence if it were not for the fact that the kinetics of H and M LDH are distinctly different. The H type, predominant in cardiac muscle, is strongly inhibited by the presence of high concentrations of pyruvate.[108] This provides a mechanism for insuring that the major route of pyruvate formed by cardiac muscle will be the respiratory pathway of the Krebs cycle, rather than conversion to lactate, a less efficient producer of energy. On the other hand, skeletal muscle contains M LDH as predominant, and this form retains its ability to catalyze reduction of pyruvate to lactate at high pyruvate concentrations, thus allowing the less well oxygenated skeletal muscle to respond to demands for rapid energy output by the contraction of an oxygen debt.

The individual mammalian tissues differ in their content of M and H units of LDH and it has recently been demonstrated that the ratios of M and H LDH concentration may be altered in certain tissues following chronic exposure to such stimuli as denervation, exposure to high or low oxygen concentrations, or maturation from prenatal to postnatal conditions.[28] It is clear, then, that the response of any tissue to a given set of concentrations of LDH substrates, coenzymes and pH will be governed not only by its hereditary ratio of M and H LDH, but also by any acquired changes in ratio of M to H LDH as the result of exposure to a variety of physiological environmental variants. Such an alteration could be responsible for the tolerance of trained athletes to strenuous exercise and anoxia and the different patterns of lactate production manifested in shock by conditioned and unconditioned animals.*

The intracellular concentration of pyruvate may also be seen (Equation 2, page 451) to influence lactate production by a tissue. Direct evidence of such an effect is provided by experiments in which blood lactate levels are seen to rise following infusions of pyruvate or of its precursors, glucose and sucrose.[29,72] Similar results follow the admin-

*References Nos. 19, 55, 115, 122.

‡ References Nos. 27, 34, 66, 71, 81, 94, 102.

§ References Nos. 2, 10, 34, 44, 61, 63, 65, 73, 79, 82, 86, 92-95, 98, 102, 106, 122.

¶ References Nos. 7, 31, 46, 54, 63, 65, 74, 80, 112, 122.

* References Nos. 31, 46, 65, 87, 88, 92, 94, 96.

istration of insulin, known to increase glucose utilization by adipose and muscle tissue, and by epinephrine, known to cause mobilization of hepatic glycogen.† Huckabee noted, however, that elevation of blood lactate by such procedures is accompanied by equivalent elevations of blood pyruvate, thus suggesting that the change in lactate concentration under these conditions is simply a response of the steady state to a new concentration of pyruvate and is not related to increased availability of reduced coenzyme I ($NADH_2$).[72]

The response of the isolated LDH system to pH changes is predictable, but in the intact animal the mechanisms are less clear. It has been shown that exposure of intact yeast cells to increasing H^+ concentrations leads to increased lactate production, which could be predicted by consideration of Equation 2.[22] The intact mammal, however, responds to a decrease in H^+ concentration with an increased output of lactate, which is contrary to the expected effect on the LDH equilibrium.[33,76,80] Such a response indicates that the effect of such a pH change in the intact muscle must register itself elsewhere than on the LDH system, and that the magnitude of that effect is such that it can overcome the direct effect of pH on the LDH system.

The elimination of the possibility of a major pH effect on $NADH_2$/NAD ratios, narrows the source of the pH effect down to the availability of pyruvate to the LDH system.[72] While direct evidence of this has not been presented, it appears most likely that the observed pH effect on lactate production is largely the result of an effect upon the production and disposition of pyruvate, such that the creation of alkalosis either increases the production of pyruvate or inhibits the disposition of pyruvate by non-LDH mediated pathways. Such a mechanism, regardless of its mediation, provides a rapidly available source of strong acid (lactic acid) in the presence of either metabolic or respiratory alkalosis and serves as an admirable compensatory mechanism.[72,135]

The remaining major influence of the set of the LDH equilibrium is the ratio of reduced to oxidized NAD present in the extra-mitochondrial cell sap. Consideration of Equation 2 leads quickly to the conclusion that this reflection of the redox potential of the cell will be primarily in the determination of the ratio of lactate to pyruvate produced, assuming pH and LDH isozyme concentration to remain stable. The significance of this relationship has been emphasized by Huckabee in a series of papers.[72-76] The ratio of $NADH_2$ to NAD will be influenced by a number of factors, all related to the oxidation and reduction of NAD. NAD is the coenzyme required by a number of enzyme systems, both intra- and extra-mitochondrial in location, and serves as an extremely important mediator of hydrogen transport within the cell. These considerations and their relationship to the control of glycolysis have been reviewed in detail by Boxer and Devlin.[17]

The sources of variables which may influence the ratio of $NADH_2$ to NAD are several. Since the respiratory pathway represents the major route of oxidation of reduced NAD in most mammalian cells, oxygenation of the cell plays a major role. This can be affected in the intact animal by primary anoxia, circulatory failure, respiratory failure, severe anemia, interference with oxygen carrying capacity of hemoglobin (for example, methemoglobinemia) or localized alterations in tissue perfusion. Clinical examples of the accumulation of lactate as the result of the existence of these conditions are frequent and have been well documented.†

In the presence of adequate oxygen, the oxidation of $NADH_2$ remains vulnerable at two points. NAD does not appear to be capable of crossing the mitochondrial membrane, and thus must depend upon intermediates for transfer of its hydrogen to the intramitochondrial respiratory chain. Two such intermediate systems which have been proposed include the alpha-glycerophosphate dehydrogenase (AGPD) and β-hydroxybutyric acid dehydrogenase (BHBD) systems, whose substrates are able to cross the mitochondrial membrane and thus may serve as transhydrogenation systems for $NADH_2$, as indicated in Figure 1.[17]

†References Nos. 1, 8, 107, 115, 125.

†References Nos. 7, 20, 31, 46, 74, 80, 92, 97, 112, 123, 128.

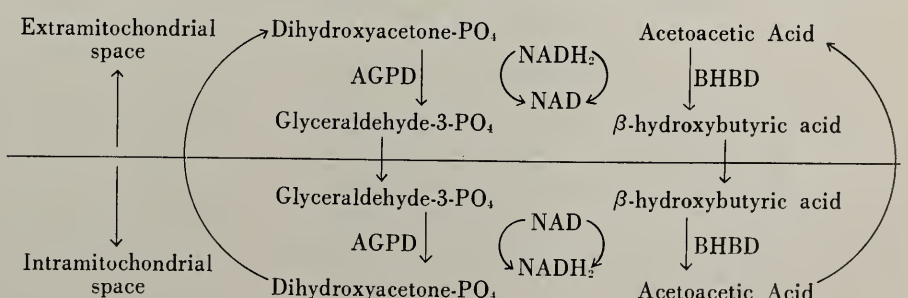


Figure 1.—Diagram of two proposed pathways for the transmission of hydrogen from reduced extramitochondrial $NADH_2$ to oxidized intramitochondrial NAD without physical transfer OF NAD from extra- to intramitochondrial space.

TABLE 1.—*A Partial List of Drugs Which Have Been Described as Inhibiting Tissue Respiration*[132]

p-Aminophenol	Antabuse
Barbiturates	Antihistamines
Diethylstilbestrol	Adrenergic Blocking Agents
Sulfonamides	Chlorpromazine
Salicylates	Phenformin Hydrochloride

Abnormalities, congenital or acquired, in the activity of these two hydrogen transfer systems have not been described in mammals, but they are indicated here as possible sources of diminished $NADH_2$ oxidation, especially under conditions of hypoxic stress when their adequacy might be crucial.

At the other end of the oxidative chain lies the Krebs tricarboxylic cycle and its close association with the respiratory chain. Deficiency in Krebs cycle activity has been conjectured and discarded as responsible for certain of the events in development of diabetic ketoacidosis.[83] On the other hand, a significant number of pharmacologically active agents, in adequate concentration, can be shown to interfere with hydrogen transport and respiration of the Krebs cycle and the respiratory chain.[133] Such an interference with normal cellular respiration leads to altered redox potentials, the accumulation of $NADH_2$ and increased lactate production. A partial list of some of the drugs known to possess this capability when in adequate concentration is included in Table 1. Clinical and experimental examples of what may be such an effect are offered by the reports of lactic acidosis accompanying phenformin, guanidine and possibly tetracycline intoxication.[14,53,119,128-130]

The oxidation of certain metabolites is mediated by NAD dependent enzyme systems, resulting in the accumulation of large amounts of $NADH_2$. Such an effect leads to an increase in the $NADH_2/NAD$ ratio and thus to increased lactate production. Ethyl alcohol is such a metabolite and the metabolism of ethanol has been shown to inhibit the metabolism of an exogenous lactate load.[26,91,120] It is possible that the increased lactate observed in the acidosis of methyl alcohol poisoning and the acidosis reported to have occurred following paraldehyde administration may be examples of the same mechanism.‡

The relationship of elevated blood lactate to contraction of an oxygen debt was first pointed out by Hill, Long and Lupton.[65] Friedman and coworkers first suggested that the relationship between the observed ratio of blood lactate to pyruvate would provide a more accurate indication of the state of oxygenation of the tissues than lactate levels alone.[45,46] Huckabee introduced the concept of "excess lactate§" in order to differentiate that lactate expected to be present as the result of the normal relationship of lactate to pyruvate, from that lactate observed in excess of the expected, which is produced as the result of an altered redox state in the tissues.[72] In addition, he proposed—and presented evidence to substantiate the proposal—that the quantity of excess lactate is related to the adequacy of oxygenation of tissues in the intact animal and in isolated segments of the circulation.[72-76] Furthermore, his evidence suggests that the concentration of excess lactate present is directly related to the ratio of reduced to oxidized NAD ($NADH_2/NAD$). While both the concept and its application have recently been subjected to question,[60,82,95,104] it is clear that all patients with lactic acidosis, in whom the values are available, have had significant amounts of excess lactate present, and that 55 per cent or more of the total blood lactate was present as excess lactate. The concept of excess lactate has proven of great usefulness, not only in the consideration of the sources of lactic acidosis but in determination of the prognosis of patients with elevated lactate from any cause[130] or from shock[20] (in both of which situations excess lactate of more than four or five mEq per liter is associated with an extremely poor prognosis), in the evaluation of respiratory distress in infants[139] and of congestive heart failure in adults.[79]

It is important to note the significance of lactate in lactic acidosis. It is the anion, lactate, which is measured in the blood by conventional methods of lactate determination. However, it is lactic *acid* which is produced by the reaction mediated by LDH:

Equation 3:*

$$CH_3\text{-}CO\text{-}COO^-H^+ + NADH^- + H^+ \xrightarrow{LDH} CH_3\text{-}CHOH\text{-}COO^-H^+ + NAD$$

The significance of this lies in the end product of pyruvate metabolism which results from this mechanism: lactic acid. Lactic acid is a strong organic acid, with a pK' of approximately 3.86, and is ionized almost completely. Thus for every mole of lactate produced, one mole of H^+ must be buffered. The other major metabolic fate of pyruvate, under aerobic conditions:

*CH_3-CO-COOH=pyruvic acid. CH_3-CHOH-COOH=lactic acid.

‡References Nos. 12, 13, 37, 62, 134.

§Excess lactate (XL) is calculated by the following formula[72]: $XL=(L_n-L_o)-(P_n-P_o)\ (L_o/P_o)$, where L_o=expected normal value of lactate, P_o=expected normal value of pyruvate, and L_n and P_n= actual values of lactate and pyruvate found, respectively.

Equation 4:

$$CH_3\text{-}CO\text{-}COO^-H^+ + NADH_2 + 3O_2 \xrightarrow{\text{Krebs Cycle}} 3H_2CO_3$$

leads to the production of weakly ionized carbonic acid, which is easily excreted by pulmonary and renal pathways and requires much less buffering than lactic acid. Depending upon the balance of factors which influence rates of anaerobic glycolysis and respiration as previously discussed, the disposition of the bulk of pyruvate may take either pathway:

Equation 5:*

$$CH_3\text{-}CO\text{-}COOH + NADH_2 \begin{cases} \xrightarrow[\text{LDH}]{\text{Anaerobic}} CH_3\text{-}CHOH\text{-}COO^- + H^+ \\ \xrightarrow[\text{Aerobic}]{\text{Krebs Cycle} + 3O_2} 3CO_2 + 3H_2O \end{cases}$$

Of additional significance is the fact that energy derivation via anaerobic glycolysis is considerably less efficient than that through the respiratory pathway. For reasons that are not fully understood, but very probably are related to the inefficient energy production of anaerobic glycolysis, tissues utilizing anaerobic glycolysis as the major pathway of energy production oxidize more glucose and produce lactic acid at a much higher rate than would be predicted from their baseline glucose uptake under aerobic conditions.[109]

Clinical Considerations

The clinical presentation of lactic acidosis is relatively uniform, usually consisting of the rather sudden onset, over a period of a few hours, of confusion, lethargy, Kussmaul respirations, and in most cases, coma. The usual presentation is that of unexplained acidosis in a previously ill patient. The explanation of the hyperpnea, tachypnea and change in mental awareness is not usually readily apparent and the differential diagnosis must include not only the significant causes of metabolic acidosis, reviewed recently by Waters and coworkers[135] and Winters and Dell,[136] but such situations as primary hyperventilation due to cerebral damage and the initial respiratory alkalosis not infrequently observed with the onset of gram-negative septicemia.

The clinical state of the patient, in addition to hyperpnea and tachypnea, which are constant features of the disease, and altered mental state from mild confusion to coma, may also include varying degrees of dehydration, evidence of vascular collapse (hypotension, tachycardia, hypothermia,[7,130] venous constriction) and evidence of the underlying disease.

Two quite confusing situations have been reported. The onset of lactic acidosis immediately following treated diabetic ketoacidosis has been reported in cases presented by Daughaday,[26] Ewy,[39] and Tranquada,[130] and their coworkers. That this can occur, emphasizes the importance of repeated determinations of serum acetone during the therapy of diabetic coma. The disappearance of significant amounts of serum acetone and continued or increasing metabolic acidosis should lead to consideration of hyperlacticemia as a possible cause.

The other confusing situation is that represented by three of the patients with lactic acidosis reported by Huckabee.[78] These patients had poliomyelitis, and required a mechanical respirator. In this situation, a low blood bicarbonate and pCO_2 is usually interpreted as indicative of metabolic alkalosis related to hyperventilation by the respirator. Huckabee initially pointed out the direct relationship of the hypocapnia of hyperventilation and increased levels of blood lactate.[72] More recently Eichenholz, in experiments with anesthetized and hyperventilated dogs, showed that the initial compensation for the respiratory alkalosis by the production of lactate was quite adequate, but that the continued hyperventilation and bicarbonate loss led eventually to a severe metabolic acidosis with decided increase in blood lactate.[35] Similar conclusions are suggested by the study of Attar, Desmond and Colley[5] of the effects in animals, of hyperbaric oxygenation in vascular collapse due to hemorrhage. Hyperventilation, significant elevation of blood lactate and the development of mild acidosis were observed, although direct determinations of muscle and liver oxygen tensions were supernormal during the hyperbaric oxygenation. It seems likely that a similar chain of events may have resulted in lactic acidosis in the cases reported by Huckabee, particularly in view of the decreased serum bicarbonate recorded for these patients, which could not have occurred without an increase in ventilation.

A survey of Table 2, which records the major underlying diseases present in 71 reported cases of lactic acidosis* reveals several items of interest.

*CH_3-CO-COOH=pyruvic acid. CH_3-CHOH-COOH=lactic acid.

*References Nos. 14, 26, 39, 40, 53, 78, 116, 128-130, 135.

TABLE 2.—*A Summary of the Underlying Diseases of 71 Patients With Lactic Acidosis**

Disease or Condition	*Number*
Uremia (BUN >35 mg per 100 ml	29
Diabetes mellitus	29
Bacterial infection	26
Pyelonephritis, acute or chronic	17
Arteriosclerotic heart disease	12
Acute pancreatitis	12
Pneumonia	11
Chronic alcoholism	10
Leukemia	9
Cirrhosis	8
Gram-negative septicemia	7
Pregnancy	7
Other heart disease	7
Acute gastrointestinal bleeding	5
Acute alcoholism	4
Chronic pulmonary disease	4
Poliomyelitis	4
Peritonitis	3
Acute hepatitis	3
Acute fatty metamorphosis of liver	3
Ascending cholangitis	3
Small bowel infarction	3
Hypothyroidism	2
Miscellaneous (1 each—liver abscess, myelofibrosis, pituitary necrosis, peripheral gangrene, pulmonary embolism, carcinoma of small bowel)	7

*References Nos. 14, 26, 39, 40, 53, 78, 116, 128, 129, 130, 135.

The conditions represented in this survey cannot be considered to have significance with respect to the distribution of underlying diseases in lactic acidosis, nor with respect to the frequency of lactic acidosis in patients with the listed diseases, since they do not represent the result of a systematic survey of these disease conditions for the presence or absence of lactic acidosis. For example, the relatively high incidence of diabetes mellitus in the reported cases may or may not have significance with respect to that disease. The fact is that the majority of the cases were reported by physicians whose opportunities to observe patients are largely concerned with diabetes. Likewise, eight of the nine cases of leukemia with lactic acidosis were observed by physicians who were dealing wholly with chemotherapeutic studies of lymphomas.

A number of the listed conditions are normally associated with decreased tissue oxygenation. Such conditions as arteriosclerotic heart disease (in which are included both patients with acute myocardial infarctions and congestive heart failure attributable to this etiology), pneumonia, other heart disease, acute gastrointestinal bleeding, chronic pulmonary disease and small bowel infarction are representative. In these situations lactate production regularly increases[77,128,129] and in some patients with these diseases, but certainly not in all, the increase may result in lactic acidosis. In this group the development of lactic acidosis frequently represented a preterminal event of relatively brief duration. Question remains as to why lactic acidosis develops only in certain patients with these conditions and not all of them.

The incidence of significant bacterial infection, as evidenced by local and systemic effects (fever, tachycardia, leukocytosis, interference with renal or pulmonary function, positive blood culture) is notable. Some of these patients were hypotensive as the result of infection, particularly those with Gram-negative bacillary septicemia. Nineteen of the 24 patients with significant infections recorded by Tranquada, Grant and Peterson[130] harbored one or more Gram-negative bacilli, and seven of them had Gram-negative septicemia. It is well known that the endotoxins of these bacteria may cause vascular collapse and reduced tissue perfusion and oxygenation.[51,85,111,132] The additional effects of infection, including localized interference with blood flow, the increased metabolic rate of hyperthermia and resultant redistribution of blood flow would reinforce the effects of other influences leading to increased lactate production.[43]

The frequency of acute pancreatitis, proved at autopsy or suggested clinically by the presence of characteristic symptoms and elevated serum amylase levels, is worthy of note. In two patients reported by Tranquada, Bernstein and Grant[130] acute pancreatitis appeared to be the primary underlying cause of lactic acidosis. In the other patients in whom this finding has been reported, it is not clear whether pancreatitis was primary or secondary to the severe acidosis. The reported high incidence of the association of acute pancreatitis and severe metabolic acidosis due to lactic acid in methyl alcohol intoxication, as well as the recent report of the frequency of the observation of elevated serum amylase in diabetic ketoacidosis, suggests that severe metabolic acidosis may play a role in the pathogenesis of acute pancreatitis.[13,41] Shubin and Weil report a high incidence of elevated serum transaminase and lactic dehydrogenase in patients with shock.[118] It may be that observations of elevations of serum concentrations of normally intracellular enzymes in severe illness and shock represent primarily the disorganization and deterioration of energy sources which normally prevent the leakage of intracellular substances into the extracellular space.

Seventeen of the 61 patients about whom such information was available had severe disturbances of hepatic function. Although the evidence is not complete on this point, it appears that the liver functions normally to remove significant amounts of lactate from the blood. It is not unlikely that significant disturbance of this function may impair the ability to deal with rates of peripheral lactate production which would not normally result

in significant elevation of blood lactate or acidosis. Ethyl alcohol is known to be metabolized initially by alcohol dehydrogenase, an enzyme concentrated primarily in the liver, with the resultant reduction of very large amounts of NAD.[91,120] The ingestion of ethanol has been shown to delay the disappearance of an administered load of lactate[26] and it may be that acute alcoholism can play a permissive role in the development of lactic acidosis similar to that of severe liver disease.

The high incidence of uremia undoubtedly reflects the frequency of cardiovascular insufficiency with resultant decreased renal blood flow. Although the kidney has been shown to take up lactate consistently,[68,89] we could find no studies of the relative role played by the kidney in the total economy of lactate in the intact animal or human. It is possible that deranged renal function or decreased renal perfusion may have an effect similar to that of severe hepatic disease, with respect to lactate metabolism. A further possibility, that of decreased renal excretion of lactate as a cause of the accumulation of lactate, is not supported by any evidence. Although there is not total agreement as to the role of the kidney in lactate excretion, it appears that lactate represents a threshold substance which does not appear in the urine in significant amounts until relatively high blood concentrations are achieved.† Even in the presence of very high levels of blood lactate the amount excreted in the urine is insignificant with respect to the rates of total production and disposition of lactate by other pathways.[77,80]

Field and coworkers suggested that the origin of lactic acidosis in their patients with leukemia is the very high rate of lactate production by leukemic leukocytes crowding small blood vessels and impeding their own oxygenation.[40] Scheerer and coworkers accepted this explanation for their patient.[116]

Table 3 presents the age and sex distribution for the reported cases of lactic acidosis. The significance of the fact that two-thirds of the patients were age 41 or above and that the sex ratio was 2:1 female to male can only be speculated upon at this time.

Laboratory Observations

Initial lactate concentrations in the 40 patients observed by Tranquada and coworkers averaged 17.5 mM/L.[130] The range of initial blood lactate levels in that series and others, in patients recognized to have lactic acidosis is from about 7 mM/L to 42 mM/L.

†References Nos. 50, 63, 80, 89, 98, 122.

TABLE 3.—*Age and Sex Distribution of Reported Cases of Lactic Acidosis in Which Figures Were Available*

	Years	*Number of Patients*
Mean Age	49	
Range	17-82	
Grouping	0-20	5
	21-40	14
	41-60	19
	>60	19
Total		57
Sex		
Male		16
Female		32
Total		48

The arterial pH is always reduced. Except in instances where respiratory acidosis complicates the picture of lactic acidosis, or where therapy with $NaHCO_3$ has already been given, a pronounced reduction in blood bicarbonate and pCO_2 is to be expected. Both Huckabee[78] and Waters, Hall and Schwartz[136] commented upon the rather constant reciprocal relationship of blood lactate and HCO_3 concentrations. Serum chloride may be normal or low, depending upon the duration of the acidosis. Serum potassium, in the absence of previous significant potassium depletion, will be elevated to the upper range of normal or above. Tranquada and coworkers[130] have observed a rather consistent and pronounced elevation of serum inorganic phosphorus in ten patients in whom the determination was made. This may prove to be a useful procedure in the differentiation of lactic acidosis, if further experience confirms this finding.

When measured, the levels of serum lactic dehydrogenase, the transaminases, and amylase are frequently found to be elevated. The significance of this finding is discussed above. Elevated blood urea nitrogen and creatinine is commonly found. Chemical evidence of deranged liver function has been reported in 20 of 64 cases.

These latter findings seem to be nonspecific changes and are not of much value in arriving at the diagnosis of lactic acidosis. In a few cases serum uric acid levels were found to be decidedly elevated.[131] Whether this finding is related to the accompanying azotemia or to the inhibition of renal uric acid excretion noted in the presence of elevated levels of circulating lactate is unknown.[50,58] The presence of significant amounts of serum acetone (a moderate or greater reaction of undiluted serum on Acetest® or similar reagent) leads to a diagnosis of ketoacidosis, unless the acidosis persists after disappearance of elevated ketone levels (see above). Blood sugar may be low, normal, or elevated. The urine pH is usually quite low, but occasionally is not.

Etiology of Lactic Acidosis

While the preceding considerations appear to provide some basis for the appearance of lactic acidosis in some patients, three significant questions, discussed by Tranquada, Grant and Peterson,[130] remain unanswered. It is clear that lactic acidosis does not develop in all patients with the above diseases. What is it about these particular subjects which led to the development of lactic acidosis? At least 24 of the 71 reported cases did not manifest underlying disease which could clearly be related to physiological conditions favoring the development of lactic acidosis. What, then, is the etiologic derivation of this derangement in those patients? Furthermore, under some conditions significant elevations of blood lactate may occur without the development of significant acidosis.[77,130] In what respect do these patients differ from those in whom acidosis develops with similar levels of blood lactate?

From a review of the diverse clinical situations from which lactic acidosis results, it seems likely that we are dealing with a syndrome of multiple possible origins, and that in any given patient the syndrome may result from one or more causes. In addition to the well recognized influences of lactate production discussed above, several hypothetical situations may be proposed. An alteration in distribution of lactic dehydrogenase isozymes, with a preponderance of the M type, due either to an hereditary abnormality or an acquired change mediated by prolonged inactivity, acute illness or infection, might result in an impaired ability to deal with situations tending to cause lactate accumulation. Likewise an hereditary or acquired deficiency in the enzyme systems normally responsible for the aerobic oxidation of $NADH_2$ might allow a normal existence until significant anoxic stress was placed upon the individual. The possible influence of drug toxicity cannot be dismissed, and has been discussed above.

The control of the balance between anaerobic glycolysis and aerobic respiration of mammalian cells is imperfectly understood, but further knowledge in this area may uncover further possible locations in which errors of metabolism might favor the development of lactic acidosis.* It is possible that unrecognized "compensated shock," as suggested by Huckabee, may exist in the majority of these patients with compartmentalized areas of tissue hypoxia due to decreased tissue perfusion.[77] Corday and coworkers demonstrated pronounced decreases in splanchnic blood flow as a compensatory mechanism in various types of shock.[25] The resulting decrease in portal flow, and the relatively large area of poorly perfused tissue resulting from such a change could be conceived of as significant influences toward the accumulation of lactic acid.[38]

*References Nos. 17, 48, 49, 84, 105, 137, 138.

Therapy

The course of the syndrome may lead to death within a matter of hours, or the condition may respond to therapy temporarily only to return hours or days later, or it may respond to relatively simple measures with complete recovery. In general, patients who have shown the least change in mental state have had the best prognosis.

The therapy of lactic acidosis has been discussed in detail by Huckabee,[78] Waters, *et al.*,[135] Tranquada, *et al.*,[129,130] Daughaday, *et al.*,[26] Field, *et al.*,[40] Moore, *et al.*,[100] and by Ewy, *et al.*[39] It is generally agreed that immediate steps should be taken to correct any underlying source of tissue anoxia which can be recognized. Likewise, correction of the acidosis with infusions of $NaHCO_3$, rather than sodium lactate, seems desirable,[117,130,135] although theoretical considerations suggest that some degree of acidosis may aid in the disposition of lactate.[33,76,129] Moore, *et al.*, have used TRIS (2-amino-2-hydroxymethyl 1, 3-propane diol) buffer effectively in correction of the lactic acidosis resulting from inadequate perfusion during cardiopulmonary by-pass procedures.[100] Ewy, *et al.*, had what appears to be a good result in one case with use of extracorporeal dialysis.[39] Tranquada, *et al.*,[130] had equivocal results in three cases in which they used peritoneal dialysis with a lactate containing dialysis fluid, and uninterpretable results in one case incompletely dialyzed with dialysis fluid in which lactate had been replaced with acetate.[127] Recently, Tranquada and coworkers presented the results of the treatment of five patients with intravenous methylene blue.[129] This redox agent had a demonstrable effect on all five patients, resulting in a lowering of the L/P ratio, a pronounced decrease of excess lactate, and may have contributed to the survival of one patient. Nevertheless, methylene blue cannot be said to be a specific for lactic acidosis although it may be used as an adjunct to therapy until more specific means or techniques become available.

Of the 58 reported cases in which results of therapy can be interpreted, there were only six survivors of lactic acidosis. It seems clear that either this syndrome represents a pre-terminal event which eludes therapeutic skill, or that a better understanding of the mechanisms involved will be required before more specific measures can be employed. It is likely that the truth lies somewhere between the two.

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REFERENCES

1. Allwood, M. J., and Cobbold, A. F.: Lactic acid release by intra-arterial adrenaline infusions before and after dibenyline, and its relationship to blood flow changes in the human forearm, J. Physiol., 157:328, 1961.

2. Andersen, K. L., Bolstad, A., and Sand, S.: The blood lactate during recovery from sprint runs, Acta Physiol. Scand., 48:231, 1960.

3. Andrews, W. H. H., Britton, H. G., and Nixon, D. A.: Fructose and lactic acid metabolism in the perfused liver in premature lambs, Nature, 191:1307, 1961.

4. Appel, K. E., and Cooper, D. A.: Diabetic acidosis with a negative ferric chloride reaction in the urine—Report of five cases, Am. J. Med. Sci., 173:201, 1927.

5. Attar, S., Desmond, W. G., and Colley, R. A.: Hyperbaric oxygenation in vascular collapse, J. Thoracic and Cardiovasc. Surg., 44:759, 1962.

6. Baird, C. W.: Glucose tolerance in metabolic acidosis, Med. J. Aust., 47:41, 1960.

7. Ballinger, W. F., II, Vollenweider, H., Pierucci, L., Jr., and Templeton, J. Y., III: The accumulation and removal of excess lactate in arterial blood during hypothermia and by ventricular bypass, Surg., 51:738, 1962.

8. Barcroft, H., and Cobbold, A. F.: The action of adrenaline on muscle blood flow and blood lactate in man, J. Physiol., 132:372, 1956.

9. Barr, D. P., and Himwich, H. E.: Studies in the physiology of muscular exercise. III. Development and duration of changes in acid-base equilibrium, J. Biol. Chem., 55:539, 1923.

10. Barr, D. P., Himwich, H. E., and Green, R. P.: Studies in the physiology of muscular exercise. I. Changes in acid-base equilibrium following short periods of vigorous muscular exercise, J. Biol. Chem., 55:495, 1923.

11. Beatty, C. H.:The effect of hemorrhage on the lactate/pyruvate ratio and arterio-venous differences in glucose and lactate, Am. J. Physiol., 143:579, 1945.

12. Beier, L. S., Pitts, W. H., and Gonick, H. C.: Metabolic acidosis occurring during paraldehyde intoxication, Ann. Int. Med., 58:155, 1963.

13. Bennett, I. L., Jr., Freeman, H. C., Mitchell, G. L., and Cooper, M. N.: Acute methyl alcohol poisoning; A review based on experiences in an outbreak of 323 cases, Medicine, 32:431, 1953.

14. Bernier, G. M., Miller, M., and Springate, C. S.: Lactic acidosis and phenformin hydrochloride, J.A.M.A., 184:43, 1963.

15. Bondy, P. K.: Some metabolic abnormalities in liver disease, Am. J. Med., 24:428, 1958.

16. Bonting, S. L., Pollak, V. E., Muerche, R. C., and Kark, R. M.: Quantitative histochemistry of the nephron. III. Lactic dehydrogenase activity in man and other species, J. Clin. Invest., 39:1381, 1960.

17. Boxer, G. E., and Devlin, T. M.: Pathways of intracellular hydrogen transport, Science, 134:1495, 1961.

18. Bravo, M., Orrego-Matte, H., and Walshe, J. M.: Carbohydrate intermediates in hepatic cirrhosis: Role of lipoic acid, J. Lab. Clin. Med., 57:213, 1961.

19. Brin, M., and Yonemoto, R. H.: Stimulation of the glucose oxidative pathway in human erythrocytes by methyline blue, J. Biol. Chem., 230:307, 1958.

20. Broder, G., and Weil, M. H.: Excess lactate: An index of reversibility of shock in human patients, Science, 143:1457, 1964.

21. Carlsten, A., Hallgren, B., Jagenburg, R., Svanborg, A., and Werkö, L.: Myocardial metabolism of glucose, lactic acid, amino acids and fatty acids in healthy human individuals at rest and at different work loads, Scand. J. Clin. Lab. Invest., 13:418, 1961.

22. Chance, B.: Techniques for the assay of respiratory enzymes, In: Methods of Enzymology, Vol. 4, Academic Press, Inc., New York, 1957, edited by Colowick, S. P., and Kaplan, N. O., pp. 282-283.

23. Clausen, S. W.: Anhydremic acidosis due to lactic acid, Am. J. Dis. Child., 29:761, 1925.

24. Coburn, A. F.: Diabetic ketosis and functional renal insufficiency, Am. J. Med. Sci., 180:178, 1930.

25. Corday, E., Irving, D. W., Gold, H., Bernstein, H., and Skelton, R. B. T.: Mesenteric vascular insufficiency. Intestinal ischemia induced by remote circulatory disturbances, Am. J. Med., 33:365, 1962.

26. Daughaday, W. H., Lipicky, R. J., and Rasinski, D. C.: Lactic acidosis as a cause of nonketotic acidosis in diabetic patients, N.E.J.M., 267:1010, 1962.

27. Davenport, H. A., and Davenport, H. K.: The lactic acid content of resting mammalian muscle, Proc. Soc. Exp. Biol. Med., 25:177, 1927-28.

28. Dawson, D. M., Goodfreind, T. L., and Kaplan, N. O.: Lactic dehydrogenases: Functions of the two types, Science, 143:929, 1964.

29. Dodds, C., Miller, A. L., and Rose, C. F. M.: Blood pyruvate and lactate response of normal subjects to dextrose, sucrose, and liquid glucose, Lancet, 2:178, 1960.

30. Drury, D. R., Wick, A. N., and Morita, T. N.: Metabolism of lactic acid in extrahepatic tissues, Am. J. Physiol., 180:345, 1955.

31. Edwards, H. T.: Lactic acid in rest and work at high altitudes, Am. J. Physiol., 116:367, 1936.

32. Edwards, W. S., Siegel, A., and Bing, R. J.: Studies on myocardial metabolism. III. Coronary blood flow, myocardial oxygen consumption and carbohydrate metabolism in experimental hemorrhagic shock, J. Clin. Invest., 33:1646, 1954.

33. Eggleton, M. G., and Evans, C. L.: Lactic acid formation and removal with change of blood reaction, J. Physiol., 70:261, 1930.

34. Eggleton, M. G., and Evans, C. L.: The lactic acid content of the blood after muscular contraction under experimental conditions, J. Physiol., 70:269, 1930.

35. Eichenholz, A., Mulhausen, R. O., Anderson, W. E., and MacDonald, F. M.: Primary hypocapnea, a cause of metabolic acidosis, J. Appl. Physiol., 17:283, 1962.

36. Eichenholz, A., Mulhausen, R. O., Redleaf, P. S.: Nature of acid-base disturbance in salicylate intoxication, Metabolism, 12:164, 1963.

37. Elkinton, J. R., Huth, E. J., Clark, J. K., Barker, E. S., and Seligson, B.: Renotubular acidosis with organic aciduria during paraldehyde ingestion—Six year study of an unusual case, Am. J. Med., 23:977, 1957.

38. Engle, F. L., Winton, M. G., and Long, C. N. H.: Biochemical studies on shock. I. The metabolism of amino acids and carbohydrate during hemorrhagic shock in the rat, J. Exper. Med., 77:397, 1943.

39. Ewy, G. A., Pabico, R. C., Maher, J. F., and Mintz, D. H.: Lactic acidosis associated with phenformin therapy and localized tissue hypoxia, Ann. Int. Med., 59:878, 1963.

40. Field, M., Block, J. B., and Rall, D. P.: Lactic acidosis in acute leukemia, Clin. Res., 11:193, 1963.

41. Finn, R., and Cope, S.: The plasma amylase in diabetic coma, Diabetes, 12:141, 1963.

42. Fletcher, W. M., and Hopkins, F. G.: Lactic acid in amphibian muscle, J. Physiol., 35:247, 1906-7.

43. Frankel, H. M., Ellis, J. P., Jr., and Cain, S. M.: Development of tissue hypoxia during progressive hyperthermia in dogs, Am. J. Physiol., 205:733, 1963.

44. Friedberg, S. J., Harlan, W. R., Jr., Trout, D. L., and Estes, E. H., Jr.: The effect of exercise on the concentration and turnover of plasma nonesterified fatty acids, J. Clin. Invest., 39:215, 1960.

45. Friedemann, T. E., and Barborka, C. J.: The significance of the ratio of lactic to pyruvic acid in the blood after exercise, J. Biol. Chem., 141:993, 1941.

46. Friedemann, T. E., Haugen, G. E., and Kmiciak, T. C.: Pyruvic acid. III. The level of pyruvic and lactic acids, and the lactic-pyruvic ratio, in the blood of human subjects—

The effect of food, light muscular activity, and anoxia at high altitudes, J. Biol. Chem., 157:673, 1945.

47. Friedman, E. A., Gray, M. J., Grynfogel, M., Hutchinson, D. L., Kelly, W. T., and Plentl, A. A.: The distribution and metabolism of C^{14} labelled lactic acid and bicarbonate in pregnant primates, J. Clin. Invest., 39:227, 1960.

48. Gatt, S., and Racker, E.: Regulatory mechanisms in carbohydrate metabolism. I. The Crabtree effect in reconstructed systems, J. Biol. Chem., 234:1015, 1959.

49. Gatt, S., and Racker, E.: Regulatory mechanisms in carbohydrate metabolism. II. Pasteur effect in reconstructed systems, J. Biol. Chem., 234:1024, 1959.

50. Gibson, H. B., and Dorsy, E. A.: A note on the effect of some organic acids upon the uric acid excretion of man, J. Biol. Chem., 55:605, 1923.

51. Gilbert, R. P.: Mechanisms of the hemodynamic effects of endotoxin, Physiol. Rev., 40:245, 1960.

52. Goldman, H. I., Karelitz, S., Seifter, E., Acs, H., and Schell, N. B.: Acidosis in premature infants due to lactic acid, Pediatrics, 27:921, 1961.

53. Gottlieb, A., Duberstein, J., and Geller, A.: Phenformin acidosis, N.E.J.M., 267:806, 1962.

54. Grodins, M. S., Lein, A., and Adler, H. F.: Changes in blood acid-base balance during asphyxia and resuscitation, Am. J. Physiol., 147:443, 1946.

55. Gutmann, H. R., Jandorf, B. J., and Bodanski, O.: The role of pyridine nucleotides in the reduction of methemoglobin, J. Biol. Chem., 169:145, 1947.

56. Gackel, D. B., and Goodale, W. T.: Effects of hemorrhagic shock on the heart and circulation of intact dogs, Circulation, 11:628, 1955.

57. Hagen, J. H., and Ball, E. G.: Studies on the metabolism of adipose tissue. IV. The effect of insulin and adrenalin on glucose utilization, lactate production, and net gas exchange, J. Biol. Chem., 235:1545, 1960.

58. Handler, J. S.: The role of lactic acid in the reduced excretion of uric acid in toxemia of pregnancy, J. Clin. Invest., 39:1526, 1960.

59. Harris, P., Bailey, T., Bateman, M., Fitzgerald, M. G., Gloster, J., Harris, E. A., and Donald, K. W.: Lactate, pyruvate, glucose, and free-fatty acid in mixed venous and arterial blood, J. Appl. Physiol., 18:933, 1963.

60. Harris, P., Bateman, M., and Gloster, J.: Relations between the cardiorespiratory effects of exercise and the arterial concentration of lactate and pyruvate in patients with rheumatic heart disease, Clin. Sci., 23:331, 1962.

61. Hastings, A. B.: The lactic acid in the blood of dogs in exercise, Proc. Soc. Exper. Biol. Med., 18:306, 1921.

62. Hayward, J. N., and Boshell, B. R.: Paraldehyde intoxication with metabolic acidosis. Report of two cases, experimental data and a critical review of the literature. Am. J. Med., 23:965, 1957.

63. Hewlett, A. W., Barnett, G. D., and Lewis, J. K.: The effect of breathing oxygen-enriched air during exercise upon pulmonary ventilation and upon the lactic acid content of blood and urine, J. Clin. Invest., 3:317, 1926-27.

64. Hift, H. and Strawitz, J. G.: Irreversible hemorrhagic shock in dogs: problem of onset of irreversibility, Am. J. Physiol., 200:269, 1961.

65. Hill, A. V., Long, C. N. H., and Lupton, H.: Muscular exercise, lactic acid in the supply and utilization of oxygen, Proc. Royal Soc., Series B., 97:84, 1924-25.

66. Himwich, H. E.: The role of lactic acid in the living organism, Yale J. Biol. Med., 4:259, 1931-32.

67. Himwich, H. E., Fazekas, J. F., and Nerif, S.: The glucose and lactic acid exchanges during hypoglycemia, Am. J. Physiol., 127:685, 1935.

68. Himwich, H. E., Koskoff, Y. D., and Nahum, L. H.: Changes in lactic acid and glucose in the blood on passage through organs, Proc. Soc. Exper. Biol. Med., 25:347, 1927-28.

69. Himwich, H. E., Koskoff, Y. D., and Nahum, L. H.: Studies in carbohydrate metabolism. I. A glucose-lactic acid cycle involving muscle and liver, J. Biol. Chem., 85:571, 1929-30.

70. Howell, R. R., Ashton, D., and Wyngaarden, J. B.: Lipid, carbohydrate and purine abnormalities in Von Gierke's disease, J. Clin. Invest., 39:997, 1960.

71. Huckabee, W. E.: Control of concentration gradients of pyruvate and lactate across cell membranes in blood, J. Appl. Physiol., 9:163, 1959.

72. Huckabee, W. E.: Relationships of pyruvate and lactate during anaerobic metabolism. I. Effects of infusion of pyruvate or glucose and of hyperventilation, J. Clin. Invest., 37:244, 1958.

73. Huckabee, W. E.: Relationships of pyruvate and lactate during anaerobic metabolism. II. Exercise and formation of O_2 debt, J. Clin. Invest., 37:255, 1958.

74. Huckabee, W. E.: Relationships of pyruvate and lactate during anaerobic metabolism. III. Effect of breathing low-oxygen gases, J. Clin. Invest., 37:264, 1958.

75. Huckabee, W. E.: Relationship of pyruvate and lactate during anaerobic metabolism. IV. Local tissue components of total body O_2-debt, Am. J. Physiol., 196:253, 1959.

76. Huckabee, W. E.: Relationship of pyruvate and lactate during anaerobic metabolism. V. Coronary adequacy, Am. J. Physiol., 200:1169, 1961.

77. Huckabee, W. E.: Abnormal resting blood lactate. 1. The significance of hyperlactatemia in hospitalized patients, Am. J. Med., 30:833, 1961.

78. Huckabee, W. E.: Abnormal resting blood lactate. 2. Lactic acidosis, Am. J. Med., 30:840, 1961.

79. Iseri, L. T., Evans, J. R., and Evans, M.: Pathogenesis of congestive heart failure, correlation between anaerobic metabolism and plasma volume changes following exercise, Ann. Int. Med., 59:788, 1963.

80. Jervell, O.: Investigation of the concentration of lactic acid in blood and urine under physiologic and pathologic conditions, Acta Med. Scand., Suppl. No. 24:1, 1928.

81. Johnson, R. E., Edwards, H. T., Dill, D. B., and Wilson, J. W.: Blood as a physico-chemical system. VIII. The distribution of lactate, J. Biol. Chem., 157:461, 1945.

82. Knuttgen, H. G.: Oxygen debt, lactate, pyruvate, and excess lactate after muscular work, J. Appl. Physiol., 17:639, 1962.

83. Krebs, H. A.: The biochemical lesion in ketosis, Arch. Int. Med., 107:51, 1961.

84. Kubista, V., and Faustka, M.: Inorganic phosphate and the rate of glycolysis in insect muscle, Nature, 195:702, 1962.

85. Kun, E., and Miller, C. P.: Effect of bacterial endotoxins on carbohydrate metabolism of rabbits, Proc. Soc. Exper. Biol. & Med., 67:221, 1948.

86. Laug, E. P.: Observations on lactic acid, total CO_2 and pH of venous blood during recovery from severe exercise, Am. J. Physiol., 107:687, 1934.

87. LePage, G. A.: Biological energy transformations during shock as shown by tissue analyses, Am. J. Physiol., 146:267, 1946.

88. Le Page, G. A.: The effects of hemorrhage on tissue metabolites, Am. J. Physiol., 147:446, 1946.

89. Levy, M. N.: Uptake of lactate and pyruvate by intact kidney of the dog, Am. J. Physiol., 202:302, 1962.

90. Lexow, P.: Diabetic coma without ketosis, Acta Med. Scand., 163:115, 1959.

91. Lieber, C. S., and Davidson, C. S.: Some metabolic effects of ethyl alcohol, Am. J. Med., 32:319, 1962.

92. Lorentzen, F. V.: Lactic acid in blood after various combinations of exercise and hypoxia, J. Appl. Physiol., 17:661, 1962.

93. Margaria, R., and Edwards, H. T.: The removal of lactic acid from the body during recovery from muscular exercise, Am. J. Physiol., 107:681, 1934.

94. Margaria, R., Edwards, H. T., and Dill, D. B.: The possible mechanisms of contraction and pain, the oxygen

debt and the role of lactic acid in muscular contraction, Am. J. Physiol., 106:689, 1933.

95. Margaria, R., Serretelli, P., diPrampro, P. E., Massari, C., and Torelli, G.: Kinetics and mechanism of oxygen debt contraction in man, J. Appl. Physiol., 18:371, 1963.

96. McShan, W. H., Potter, B. R., Boldman, B. A., Shipley, E. G., and Meyer, R. K.: Biological energy transformations during shock as shown by blood chemistry, Am. J. Physiol., 145:93, 1945.

97. Meakins, J., and Long, C. N. H.: Oxygen consumption, oxygen debt and lactic acid in circulatory failure, J. Clin. Invest., 4:273, 1927.

98. Miller, A. T., Jr., and Miller, J. O., Jr.: Renal excretion of lactic acid in exercise, J. Appl. Physiol., 1:614, 1949.

99. Minot, A. S., Dodd, K., and Saunders, J. M.: The acidosis of guanidine intoxication, J. Clin. Invest., 13:917, 1934.

100. Moore, D., Bernhart, W. F.: Efficiency of 2-amino-2-hydroxymethyl-1-,3-propanediol (TRIS buffer) in management of metabolic lactic acidosis accompanying prolonged hypothermic perfusions, Surgery, 52:905, 1962.

101. Nalebuff, D. J., and Winternitz, W. W.: Lactic acid response to epinephrine in exeperimental liver disease—A review, Yale J. Biol. Med., 29:96, 1956.

102. Newman, E. V.: Distribution of lactic acid between blood and muscle of rats, Am. J. Physiol., 122:359, 1938.

103. Oei, T. L.: Hexosemonophosphate, pyruvate, and lactate in the peripheral blood in glycogen storage disease, Clin. Chim. Acta, 7:193, 1962.

104. Olson, R. E.: "Excess Lactate" and anaerobiosis, Ann. Int. Med., 59:960, 1963.

105. Omachi, A., Ginski, J. M., and Macey, R. I.: Phosphate uptake by isolated rabbit heart, Am. J. Physiol., 202:1147, 1962.

106. Owles, W. H.: Alterations in the lactic acid content of the blood as a result of light exercise, and associated changes in the CO_2-combining power of the blood and in the alveolar CO_2 pressure, J. Physiol., 69:214, 1930.

107. Peters, J. P., Jr., and Geyelin, H. R.: The relation of adrenalin hyperglycemia to decreased alkali reserve of the blood, J. Biol. Chem., 31:471, 1917.

108. Plummer, E. T., Elliott, E. A., Cooke, K. B., and Wilkinson, J. H.: Organ specificity and lactate-dehydrogenase activity (1) The relative activities with pyruvate and 2-oxobutyrate of electrophoretically separated fractions, Biochem. J., 87:416, 1963.

109. Randle, P. J., and Smith, G. H.: Regulation of glucose uptake by muscle, Biochem. J., 70:501, 1958.

110. Reynolds, T. B., Payton, A., Freeman, M., Howard, F., and Sherlock, S.: The effect of hexamethonium bromide on splanchnic blood flow, oxygen consumption and glucose output in man, J. Clin. Invest., 32:793, 1953.

111. Robeson, F. S.: The endotoxins of Gram-negative bacteria and host resistance, N.E.J.M., 264:919-923, 980-985, 1961.

112. Ronzoni, E., Koechig, I., and Eton, E. P.: Ether anesthesia. III. Role of lactic acid in the acidosis of ether anesthesia, J. Biol. Chem., 61:465, 1924.

113. Rosenbloom, J.: A form of diabetic coma not due to the acetone bodies, N. Y. Med. J., 102:294, 1915.

114. Russel, J. A., Long, C. N. H., and Engel, F. L.: Biochemical studies of shock II. The role of the peripheral tissues in the metabolism of protein and carbohydrate during hemorrhagic shock in the rat, J. Exper. Med., 79:1, 1944.

115. Seligman, A. M., Frank, H. A., Alexander, D., and Fine, J.: Traumatic shock. XV. Carbohydrate metabolism in hemorrhagic shock in the dog, J. Clin. Invest., 26:536, 1947.

116. Scheerer, P. P., Pierre, R. V., Schwartz, D. L., and Linman, J. W.: Reed-Sternberg-Cell leukemia and lactic acidosis: Unusual manifestations of Hodgkin's disease, N.E.J.M., 270:274, 1964.

117. Schwartz, W. B., and Waters, W. C.: Lactate versus bicarbonate. A reconsideration of the therapy of metabolic acidosis, Am. J. Med., 32:831, 1962.

118. Shubin, H., and Weil, M. H.: Acute elevation of serum transaminase and lactic dehydrogenase during circulatory shock, Am. J. Cardiol., 11:327, 1963.

119. Shultz, J. C., Adamson, J. S., Jr., Workman, W. W., and Normal, T. D.: Fatal liver disease after intravenous administration of Tetracycline in high dosage, N.E.J.M., 269:999, 1963.

120. Smith, M. E., and Newman, H. W.: The rate of ethanol metabolism in fed and fasting animals, J. Biol. Chem., 234:1544, 1959.

121. Snell, A. M., and Butt, H. R.: Hepatic coma: Observations bearing on its nature and treatment, Trans. Assoc. Amer. Physic., 56:321, 1941.

122. Strom, G.: The influence of anoxia on lactate utilization in man after prolonged muscular work, Acta Physiol. Scand., 17:440, 1949.

123. Tepperman, J., and Tepperman, H. M.: The blood lactic acid response to measured exercise in hypoxic human subjects, J. Clin. Invest., 27:176, 1948.

124. Terry, I. S., and Crandall, L. A., Jr.: The absence of a significant glucose-lactic acid cycle (involving the liver) in normal unanesthetized dogs, Am. J. Physiol., 125:41, 1939.

125. Tolstoi, E., Loedel, R. O., Levine, S. Z., and Richardson, H. B.: The production of lactic acid in diabetes following the administration of insulin, Proc. Soc. Exper. Biol. Med., 21:449, 1924.

126. Tranquada, R. E., Kleeman, C., and Brown, J.: Some effects of phenethylbiguanide on human hepatic metabolism as measured by hepatic vein catheterization, Diabetes, 9:207, 1960.

127. Tranquada, R. E., Beigelman, P. M., and Onoprienko, I. S.: The effect of insulin on lactic acid production by rat adipose tissue, Clin., Res., 8:144, 1960.

128. Tranquada, R. E., Bernstein, S., and Martin, H. E.: Irreversible lactic acidosis associated with phenformin therapy, J.A.M.A., 184:43, 1963.

129. Tranquada, R. E., Bernstein, S., and Grant, W. J.: Intravenous methylene blue in the therapy of lactic acidosis, Arch. Int. Med., 114:13, 1964.

130. Tranquada, R. E., Grant, W. J., and Peterson, C.: Lactic acidosis. Experience with 40 cases. Submitted for publication.

131. Tranquada, R. E.: Unpublished observations.

132. Udhoji, V. N., Weil, M. H., Sambhi, M. P., and Rosoff, L.: Hemodynamic studies on clinical shock associated with infection, Am. J. Med., 34:461, 1963.

133. Ungar, G., Psychoyos, S., and Hall, H. A.: Action of phenethylbiguanide, a hypoglycemic agent, on tricarboxylic acid cycle, Metabolism, 9:36, 1960.

134. Waterhouse, C., and Stern, E. A.: Metabolic acidosis occurring during administration of paraldehyde, Am. J. Med., 23:987, 1957.

135. Waters, W. C., Hall, J. D., and Schwartz, W. B.: Spontaneous lactic acidosis. The nature of the acid-base disturbance and considerations on diagnosis and management, Am. J. Med., 35:781, 1963.

136. Winters, R. W., and Dell, R. B.: Clinical physiology of metabolic acidosis, Post Grad. Med., 31:161, 1962.

137. Wu, R., and Racker, E.: Regulatory mechanisms in carbohydrate metabolism. III. Limiting factors in glycolysis of ascites tumor cells, J. Biol. Chem., 234:1029, 1959.

138. Wu, R., and Racker, E.: Regulatory mechanisms in carbohydrate metabolism. IV. Pasteur effect and Crabtree effect in ascites tumor cells, J. Biol. Chem., 234:1036, 1959.

139. Yamamura, Y., Kusunose, M., and Kusunose, E.: Lactic oxidases of Mycobacterium Tuberculosis Avium, Nature, 170:207, 1952.

140. Znamenachek, K., and Pribylova, H.: The significance of blood "excess lactate" in the new-born period, Acta. Paediatrica, 53:301, 1964.

Tumors of the Thyroid and Parathyroid Glands

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SINCE THE PRINCIPAL emphasis of the California Cancer Commission series has been upon malignant tumors, the present article will be particularly concerned with tumors of the thyroid rather than those of the parathyroid glands. The series from the University of California Medical Center on which this report is based includes more than 400 malignant tumors of the thyroid gland but no authentic instances of malignant disease of the parathyroid were found in more than 140 cases of hyperparathyroidism.

Although the first report on the relationship of radioactive iodine to cancer of the thyroid gland from the University of California Medical Center was published in 1940,[17] no mention was made of I^{131} by the senior author in his earlier article for *Cancer Studies* published in 1948. With the introduction of radioactive iodine much has been learned about the diagnosis and treatment of thyroid cancer, but it has not proved to be the answer to therapy hoped for in the early days of its use. As is true with cancer in other regions, early diagnosis and complete surgical removal of malignant lesions of the thyroid gland offer the best prognosis. The differences of opinion regarding cancer of the thyroid gland center around the incidence, diagnosis and prognosis, extent of operation and the advisability and amount of internal or external irradiation.

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Carcinoma of the Thyroid Gland

Clinical Diagnosis. Goiters become surgical problems for the following reasons: (1) hyperthyroidism, (2) mechanical difficulties, and (3) the question of malignancy. The diagnosis and treatment of hyperthyroidism will not be considered here except to point out that the actual presence of hyperthyroidism does not rule out malignant disease, but only upon very rare occasions is it encountered in diffuse toxic, or even nodular toxic, goiter. Displacement of and pressure upon the cervical and mediastinal structures may accompany either benign or malignant enlargement of the thyroid gland and these cases become surgical problems because of associated symptoms. The number of patients being treated surgically because of pressure symptoms has not varied greatly over the years but the number of patients upon whom operation is performed for treatment of hyperthyroidism has declined steadily as medical management has become more effective. However, the percentage of patients operated upon because of possible malignant change is increasing in all series reported.[16,38]

It is generally agreed that most malignant lesions of the thyroid gland first appear as nodular goiters. The diagnostic problem is one of determining which nodular goiters are benign and which should be suspected of harboring malignant changes. Certain findings in the history and physical examination should put nodular goiters under suspicion. The first and most important is recent, rapid growth of the gland or nodule. If the patient is to be under

observation or treatment, caliper measurements of the gland and the nodules should be made to determine growth or regression. Hoarseness and dysphagia suggest malignant change but are occasionally seen in thyroiditis. In the latter case the gland may be somewhat tender, is usually firm and of normal configuration. On the scintigram, thyroiditis is usually manifested by a meager, uniform uptake of radioactive iodine rather than "cold" areas. If hoarseness is found to be due to vocal cord paralysis, this points more strongly to malignant disease.

Diagnosis

Single Nodule. The value of classifying glands as single or multinodular is often discussed. The accuracy of clinical evaluation of the single nodule is in question, and varies from 100 per cent, as reported by Slater and Lipton,[33] to 50 per cent as reported by Boggs.[6] In our series at the University of California Medical Center, San Francisco, operative and pathological findings confirmed the presence of a single nodule 162 times in 192 cases in which it was so diagnosed preoperatively.[20] Williams and coworkers[39] showed that the likelihood of malignant change in a goiter with a clinically solitary nodule is three to four times greater than if the goiter is multinodular. They found that 14.6 per cent of uninodular goiters were malignant compared with 4.3 per cent of multinodular glands. Shimaoka and his coworkers[31] found no significant difference in the frequency of malignant change between uninodular and multinodular goiter. Bartels[3] stated that in the diagnosis of carcinoma of the thyroid, the clinical history, examination of the gland, and even the surgeon's opinion at the time of operation are often inaccurate.

Scintiscan. A scintiscan obtained after the ingestion of a test dose of I^{131} may be useful in detecting malignant change in a nodular goiter. The finding of a "cold" nodule by this method is consistent with but not diagnostic of cancer. Dobyns'[14] experience over the past 15 years has shown no hyperfunctioning nodules that contained carcinoma, and he has pointed out that even the most actively functioning carcinomas of the thyroid take up I^{131} to a lesser degree than does normal thyroid tissue. He stated that the appraisal of functional quality of the irregular areas in a nodular goiter should be regarded as obligatory before surgical treatment is undertaken. It was his opinion that all carcinomas would be found among the so-called "cold nodules." Meadows[25] has found carcinoma in 58 per cent of nonfunctional, clinically solitary nodules. Becker and his colleagues[4] reported two cases of carcinoma in "hot" nodules.

Therapeutic Test. Another diagnostic method favored by some investigators is a therapeutic test

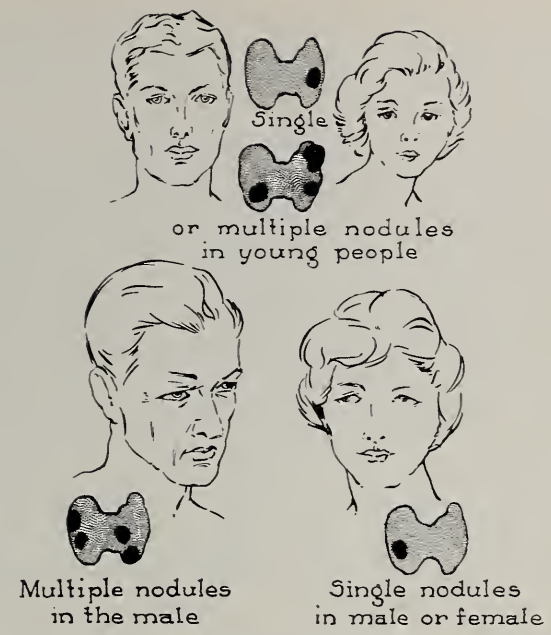


Figure 1.—Types of patient in whom malignant goiter should be suspected when nodular goiter is present.

based on the assumption that nodular goiters occur because of oversecretion of thyroid-stimulating hormone (TSH). This test is designed to block the stimulation of TSH by administration of sufficient amounts of desiccated thyroid, I-triiodothyronine (T_3), or sodium levothyroxine (T_4). Some investigators, notably Astwood and his colleagues,[1] strongly endorse this test and feel that only the nodular goiters that do not disappear after thyroid administration should be treated surgically. Others, including Byrd and coworkers[9] and Colcock and Cattell,[31] feel that thyroid administration may mask the clinical picture and lead to a fatal delay in the diagnosis of malignant disease.

Bowens and coworkers[7] suggest that little risk is involved in administering thyroid or T_3 to patients with asymptomatic thyroid nodules if there are no clinical indications of cancer. Shimaoka and his colleagues[31] are of the same opinion. If little reduction in the size of the thyroid occurs after this test administration of hormones or if the size increases, as demonstrated by caliper measurements during the test, then surgical exploration becomes imperative. It is our opinion that the administration of thyroid or the faster-acting T_3 as a test for malignant change should be limited to not more than five months. Badillo and coworkers[2] suggest that six months may be too long a therapeutic test. We warn against indiscriminate or prolonged unresponsive use of hormone therapy in nodular goiter. Disappearance of nodules is relatively rare and a slight decrease in the size of the gland or nodules does not rule out malignant change. Vieth and coworkers[47] recommended only two to four

months of suppression therapy before operation and emphasized the importance of hormone therapy after operation for either benign or malignant goiter.

Statistical Suspicion. In certain patients suspicion is aroused by the presence of a nodular goiter or persistent cervical adenopathy.[22,38] These patients include: (1) prepubertal children, (2) men with non-toxic nodular goiter, and (3) any patient with a solitary nodule (Figure 1). In children and adult males such findings are suspicious since these groups have not been exposed (as adult women are) to the stimulus of the varying physiologic demands for thyroid activity associated with menstruation, childbearing, lactation and the climacteric. Hayles and his coworkers[18] have agreed that malignant disease of the thyroid should be suspected in any child with nodular goiter or persistent cervical adenopathy until proved not to be present.

One of us (RW) found carcinoma in five out of 30 (16.6 per cent) male patients operated upon for nontoxic nodular goiter. Majarakis and his coworkers[23] found malignant change four times as often in males with non-toxic nodular goiters as in females. The solitary nodule is suspect in women because such nodules are more often neoplastic than are the involuntary nodules involved in multinodular goiter.

Because the only way to determine malignancy positively is by microscopic examination and since the choice of proper therapy depends upon the type of malignant change, a review of the histologic types of malignant lesions and their life histories is in order.

General Pathology

The two basic forms of thyroid carcinoma are papillary and follicular. Some papillary carcinomas contain only a few papillary structures and may display mainly follicular or solid lobular patterns. The recognition of the true papillary nature of neoplasms that have a follicular pattern is important because of the significant differences in the clinical course and accepted methods of therapy of the two neoplasms.

Papillary Carcinoma. Papillary carcinoma is the most common form of thyroid cancer in the United States. It occurs at all ages but is most frequent in persons between the ages of 20 and 40. It is usually a slowly growing neoplasm which tends to invade and permeate the lymphatic channels of the thyroid and thus extend to the opposite lobe. It also invades blood vessels and metastasizes to distant sites where it may remain dormant for many years. More commonly, metastasis appears first in pericapsular lymph nodes and then in regional lymph nodes in the cervical chain.

Follicular Carcinoma. Several forms of follicular carcinoma are encountered. Localized follicular carcinoma presents as a nodule differing from a benign adenoma by the presence of capsular or vascular invasion, or both; and some degree of cellular and nuclear pleomorphism and mitotic activity. Histologic patterns are predominantly microfollicular and trabecular. The nuclei are unlike those of papillary carcinoma; they are smaller and contain abundant, coarse chromatin material. These follicular carcinomas rarely invade lymphatic channels, but distant metastasis, usually in the skeleton, results from intravascular growth and extension of the neoplasm. Localized follicular carcinoma occurs at all ages, except during the first nine years of life.

Invasive follicular carcinoma may originate from a pre-existing benign adenoma, and an encapsulated angio-invasive adenoma or localized follicular carcinoma may be one stage of its development. These neoplasms spread in the thyroid gland by local invasion rather than lymphatic permeation. Varying degrees of follicular differentiation and colloid formation are usually present. The nuclei are dense and hyperchromatic as in localized follicular carcinoma. The peak incidence of invasive follicular carcinoma occurs in patients between the ages of 50 and 59. The frequency of distant metastasis resulting from vascular dissemination is considerably greater in follicular carcinoma than in papillary carcinoma.

Included in the group of follicular carcinomas are medullary or solid carcinomas, described by Hazard and coworkers.[19] The neoplasms are characterized by a relatively solid epithelial pattern although a few microfollicles are frequently observed. Abundant deposits of amyloid are invariably found in the stroma of the supporting connective tissue of these neoplasms and there is evidence that the amyloid is produced by the neoplastic epithelium. Unlike other follicular carcinomas, these lesions have a propensity for metastasizing to regional lymph nodes. Distant metastasis also occurs in almost half the cases. Medullary carcinomas are found in patients between the ages of 28 and 80, with the highest incidence between 50 and 59.

Anaplastic Carcinoma. Anaplastic carcinoma is an undifferentiated form of thyroidal epithelial neoplasm that shows no papillary and little or no follicular formation. These neoplasms, which occur almost exclusively in women, grow extremely rapidly and most of the patients die within a few months. It is believed that some anaplastic or undifferentiated carcinomas may originate from either papillary or follicular carcinomas and that

they represent the undifferentiated end-stage of differentiated thyroid carcinomas. Most patients with anaplastic carcinoma have had goiter for many years but a superimposed, rapidly growing malignant neoplasm usually does not appear until after the age of 40 or 50. The predominant microscopic pattern in most cases consists of large sheets of extremely bizarre, large, multinucleated or elongated spindle-shaped cells. Some of these giant-cell carcinomas may have an epidermoid component. However, patients with other anaplastic carcinomas which consist of large or small cells, including spindle-cell variants, may survive longer than patients with giant-cell anaplastic carcinoma. Anaplastic carcinoma frequently invades the cervical tissues beyond the capsule of the thyroid, and metastasis to regional lymph nodes and distant sites is common. As a rule, however, the extremely rapid growth causes death from respiratory obstruction before distant metastasis becomes clinically evident.

Pathologic Diagnosis. After surgical removal, the thyroid specimen should be submitted to the pathologist for examination. The external surface of the tissue may reveal evidence of malignant neoplasia in the form of a thickened, scarred and retracted thyroid capsule, enlarged pericapsular lymph nodes or enlarged vessels invaded by neoplastic tissue. When the thyroid specimen, usually a lobe, is sectioned, gross characteristics of the tissue may suggest whether an existing nodule is benign or malignant; for example, benign nodules are almost always well-encapsulated. Extensions of the tissue comprising a nodule beyond the capsule of the nodule suggest invasive tendencies, and satellite nodules outside the capsule of the nodule are further evidence of malignancy. Follicular or trabecular adenomas generally have a yellowish-pink, yellowish-tan, or pinkish-tan uniform, homogeneous, bulging surface, but papillary neoplasms, whether benign or malignant, have a characteristically granular and pebbly cut surface. Medullary carcinoma appears firm, pale and opaque due to its amyloid content, and central calcification is frequent. Anaplastic carcinoma as a rule is meaty, vascular, and often hemorrhagic and partially necrotic. In contrast, benign macrofollicular adenomas (so-called involutionary nodules) are circumscribed and encapsulated. The variegated cut surface has an abundance of glistening colloid, and almost always shows signs of old and recent hemorrhage, fibrosis and deposits of cholesterol.

Although gross examination of the tissue may lead to an accurate diagnosis, examination by frozen section should also be done. Tissue blocks to be examined should be selected from characteristic portions of the nodule. In the case of a partially encapsulated nodule, sections at points where the capsule appears deficient may reveal neoplastic invasion of adjacent thyroid parenchyma or blood vessels. Frozen sections of thyroid tissue are notoriously difficult to prepare since the tissue tends to fold and wrinkle, and colloid from follicles may become displaced. The increasing use of the cryostat in place of the freezing microtome solves this problem, since sections prepared with this apparatus are almost as good as those made from paraffin blocks. In some cases, thyroid neoplasms may be so well-differentiated that they closely resemble normal thyroid tissue, although the lobular pattern of normal thyroid tissue is not present.

Many papillary carcinomas have a predominantly follicular pattern. Differentiation from follicular carcinoma usually depends upon demonstrating the characteristically pale, opaque, poorly-staining nuclei of papillary carcinoma. However, these nuclei stain with thionine, frequently used to stain frozen sections, which may lead to an incorrect diagnosis of follicular carcinoma. For that reason, frozen sections of thyroid tissue should be stained with hematoxylin and eosin. Papillary carcinomas may also be identified by the presence of typical concentric calcific structures or psammoma bodies. Primary papillary carcinomas frequently contain a central zone of scarring with calcific deposits. Intraglandular extensions of papillary carcinomas do not as a rule show these changes. If a papillary neoplasm is free of such complications, a search for primary papillary carcinoma in the opposite lobe should be made.

The preparation of permanent paraffin sections should include multiple blocks from the periphery of circumscribed or encapsulated nodules in order to demonstrate intravascular invasion. A careful search should be made in the thyroid capsule for adherent pericapsular lymph nodes, and multiple sections of the uninvolved portions of the gland should be examined for evidence of intraglandular extension.

Treatment

Although it is agreed that surgical removal is the most effective treatment of cancer of the thyroid, controversy still centers around the indications for biopsy, lobectomy, total thyroidectomy and the combination of these with modified or radical neck dissection.

Incisional Biopsy. When a differential diagnosis must be made between infiltrating carcinoma and thyroiditis, an incisional biopsy is occasionally warranted. If the presence of thyroiditis is confirmed, it is best handled by means other than surgical removal. If infiltrating carcinoma is found,

the biopsy site can be excised with the radical excision of carcinoma, the type of which is determined by the biopsy findings. Needle biopsy is not used at the University of California Medical Center; it can be relied upon only for the detection of thyroiditis in questionable cases and cannot be trusted to rule out malignant change.

Excisional Biopsy. Only when there is the problem of a differential diagnosis between lymphoma and metastatic carcinoma in a young person is excisional biopsy of a node justified. If excisional biopsy reveals thyroid carcinoma metastatic to a lateral lymph node, an intelligent and effective operation based on the microscopic diagnosis can be planned to include excision of the biopsy site.

Lobectomy. Probably the most common and satisfactory approach to microscopic diagnosis is excisional biopsy and lobectomy. The shelling out of a suspicious or solitary nodule should be condemned. If unsuspected follicular carcinoma is found in paraffin sections after a lobectomy with adequate margins, we do not advise immediate further operation. However, if lobectomy reveals papillary carcinoma or if signs of multicentricity or intraglandular lymphatic spread are present, immediate total thyroidectomy is recommended. Statistics from the University of California Medical Center show little difference in the number and severity of complications following total and subtotal thyroidectomy for carcinoma[30] except for the greater incidence of hypoparathyroidism in the former.

Total Thyroidectomy. The main hazards in total thyroidectomy are bilateral damage to the recurrent laryngeal nerves and persistent postoperative parathyroid insufficiency. Recurrent laryngeal nerves can usually be preserved by adequate exposure and careful dissection unless they are actually involved in the malignant process. Preservation of parathyroid function is more difficult. When feasible, it is desirable to leave a small portion of the posterior capsule of the uninvolved thyroid lobe, thereby preserving the blood supply and integrity of at least one parathyroid gland.

The advocates of total thyroidectomy for all cases of cancer of the thyroid[11,12,28,29] have recommended this procedure in preference to unilateral lobectomy, since 35 per cent of the group treated by unilateral lobectomy have had recurrence in the contralateral lobe. Tollefsen and DeCosse,[36] after finding a recurrence rate of 3.7 per cent in the contralateral lobe, stated that total thyroidectomy for papillary carcinoma of the thyroid is unjustified. They reached this conclusion in spite of the fact that microscopic carcinoma was found in the contralateral lobe of 30 per cent of their patients in whom a total thyroidectomy was performed as initial surgical treatment. MacDonald and Kotin,[71] early advocates of total thyroidectomy for papillary carcinoma, believe that total lobectomy is too drastic in benign goiter and is inadequate for malignant tumors. They consider total thyroidectomy and regional dissection mandatory for established cases of papillary carcinoma and state that radical neck dissection should be limited to the side where positive node metastasis has been demonstrated.

We believe that no rules can be laid down as to the extent of operation, and that the decision to perform total thyroidectomy with or without radical neck dissection depends upon the pathological findings on frozen sections, age of the patient, degree of involvement, presence of demonstrable adenopathy and the risk involved.

Radical Neck Dissection. More controversy probably exists concerning neck dissection than any other form of surgical treatment of cancer of the thyroid. We completely agree with Thomas,[34] and Macdonald and Kotin[21] who feel that neck dissection in thyroid cancer is indicated in the presence of enlarged involved nodes. Thomas[34] points out that carcinoma of the thyroid is unique in that the routes of lymphatic drainage are singularly available for examination at the time of removal of the primary tumor. The surgeon familiar with these common routes should be able to detect palpable enlarged nodes and to have them examined cryostatically for malignant change at the time of operation. We concur with Thomas[34] and Dobyns[14] that the type of radical neck dissection performed for malignant lesions of the lip, tongue, mouth and pharynx is seldom necessary to eliminate carcinoma of the thyroid except in the infrequent instances in which it has spread to the anterior superior cervical lymph nodes. Dobyns points out that the sternocleidomastoid muscle becomes involved only when other lymphatic pathways are thoroughly blocked by metastatic spread.

By using the criteria laid down by these authors a decision can be made as to the advisability and extent of neck dissection, thus eliminating the questionable value of "prophylactic" dissection and its claimed benefits.

External Radiation Therapy. Papillary adenocarcinomas are only moderately sensitive to irradiation and are rarely, if ever, curable with doses tolerated by normal tissues. These lesions may, however, significantly regress with radiation therapy and thus can be controlled for many years. Radiation therapy is useful when carcinoma is not completely resectable or when local recurrence is inoperable. For papillary adenocarcinoma, the radiation fields should be limited to the area of suspected disease and the doses should be relatively high. Prophy-

lactic irradiation of uninvolved lymph node chains is contraindicated.

Follicular adenocarcinoma is probably less radiosensitive than papillary adenocarcinoma but occasionally it can be controlled for years by aggressive radiation therapy. Neither the thyroid area nor the adjacent lymph nodes should be irradiated prophylactically when surgical removal of diseased tissue is thought to be complete. Radiation therapy for palliation of distant metastatic lesions from papillary or follicular adenocarcinoma is often of value. Local symptoms or tumor growth may be controlled for prolonged periods.

Lymphosarcoma and anaplastic carcinoma often have a pronounced radiosensitivity. These lesions are locally invasive and widely metastatic, characteristics that frequently limit the surgical procedure to biopsy. Local control may be achieved by irradiation, but the prognosis is unfavorable because of the tendency to extensive metastasis. The prognosis for lymphosarcoma arising in the thyroid is more favorable than that for anaplastic carcinoma. Giant-cell anaplastic carcinoma responds poorly to irradiation and is rarely controlled by any means.

Internal Radiation Therapy. The use of I^{131} in the treatment of thyroid cancer is based on the fact that certain of these neoplasms metabolize and concentrate iodine. Thus, I^{131} provides a means of selective internal irradiation. Although a correlation between histologic findings and iodine concentration exists, exceptions are numerous and each patient requires individual study.

In the presence of normal thyroid tissue, thyroid carcinoma rarely shows a significant avidity for radioactive iodine; therefore, in evaluating the possibility of I^{131} therapy, the initial step is complete thyroid ablation by operation, radioactive iodine or both. The subsequent increase in endogenous thyroid-stimulating hormone (TSH) may stimulate the thyroid carcinoma and promote adequate iodine-localization in the tumor. Stimulation by exogenous TSH is occasionally successful in patients in whom thyroidectomy has not been performed, but it must be administered each time the patient is to be studied or treated. Exogenous TSH to supplement TSH induced endogenously by thyroidectomy has been used, but it usually has little effect over and above that resulting from thyroid ablation alone. Antithyroid drugs have also been used in an attempt to stimulate thyroid carcinoma and thereby increase the uptake of I^{131}. When the blocking action of these drugs is abruptly terminated, stimulation appears as a rebound phenomenon. Thiouracil and its derivatives have been used for this purpose but must be given in large doses for several months. The antithyroid drugs have a theoretical advantage in that they not only suppress any remnant of non-neoplastic thyroid tissue but also suppress hormone production from the carcinoma itself and thus allow maximal endogenous TSH production. Generally, however, the use of antithyroid drugs has been disappointing.

Data regarding the frequency with which a useful concentration of I^{131} can be activated in thyroid carcinomas vary with the enthusiasm of the investigator. Iodine avidity sufficient to merit consideration of I^{131} therapy can probably be established in about half of all patients with differentiated thyroid carcinoma. Therapy consists of the administration of I^{131}, either in a single dose of 200 or more millicuries, or in several doses at intervals of one to two months. The tumor may regress in from one-third to one-half of the patients so treated, and occasionally evidence of carcinoma will disappear entirely. Since the lesions that respond are usually the untreated, long-standing, well-differentiated follicular and papillary carcinomas, not enough time has elapsed for us to say with certainty that any patient has been cured by I^{131} therapy. Many patients, however, are free of the disease five and ten years after I^{131} treatment and the usefulness of the method in the selected patient is well established.

It should be pointed out that the large amounts of I^{131} required to treat thyroid cancer may have an adverse effect on the hematopoietic system. Depression of this system is usually indicated by a transient reduction of all formed elements of the blood, although fatal depressions in bone marrow have occasionally occurred after massive doses of I^{131}. It has been estimated that total body irradiation from several hundred millicuries of I^{131} will cause leukemia in from three to five per cent of the treated patients.[8,24] This represents a relatively small risk for the patient with advancing, uncontrolled carcinoma but it certainly rules out the use of I^{131} as prophylactic therapy.

Hormone Therapy. In 1937 Sir Thomas Dunhill[15] described complete regression of the neoplasm in two children with carcinoma of the thyroid after administration of fairly large doses of desiccated thyroid. It has since been found that many of the papillary and alveolar carcinomas of the thyroid are dependent upon stimulation by pituitary thyrotrophin (TSH). It has further been shown that administration of desiccated thyroid, thyroxin, I-triiodothyronine (T_3) or sodium-I-thyroxin (T_4) will inhibit TSH production.[35] The conclusion has therefore been reached that the administration of desiccated thyroid, or better, T_3 or T_4, is indicated postoperatively in the hope that the tumor will become or remain hormone-dependent. In many cases reported in the literature advanced carcinomas have remained hormone-dependent for years.[37]

Hormone-suppressive therapy should be pushed to tolerance and if T_3 is used, 100 to 200 micrograms daily may be indicated.[34]

Carcinoma of the Parathyroid Glands

Carcinoma of the parathyroid glands is rare, and is the cause of hyperparathyroidism in only 1 to 3 per cent of all cases.[5,27] In more than 140 patients with proved hyperparathyroidism, we have not encountered a single instance of carcinoma. That nonfunctioning carcinoma of this gland may exist, as reported by Sieracki and Horn,[32] cannot be denied, but because of its microscopic resemblance to carcinoma of the thyroid and other tumors the absence of endocrinological effects throws some suspicion on the diagnosis. One such patient was encountered during this same period.

Clinical, laboratory and roentgenologic evidence of hyperparathyroidism in a patient with a palpable cervical mass, a tumor infiltrating local structures, metastasis to the regional and mediastinal lymph nodes and possibly to the lungs and liver, are among the manifestations of this neoplasm.[10,26] The diagnosis should be suspected at the operating table when a tumor found near the parathyroid glands is hard, with or without calcification, adherent or infiltrating, and appears malignant on microscopic examination with or without evidence of invasion.[10] Each recurrence of the tumor is accompanied by hormonal manifestations of hyperparathyroidism.

Since this tumor has a tendency to recur locally, attempts should be made to excise it in its entirety, together with removal of involved regional lymph nodes. Some patients survive for several years but eventually succumb from the effects of local recurrence, metastasis, or more commonly from renal insufficiency or hypertension accompanying hyperparathyroidism. If the tumor is still limited to the parathyroid structures when operated upon, total and complete removal of the tumor alone may suffice. In the cases described here, the initial operation was not radical so that recurrence was the rule. Therefore an attempt should be made initially to remove all the tumor, including the thyroid lobe, regional lymph nodes, recurrent nerve and any other structure which is to be sacrificed. Usually, carcinoma has spread beyond the capsule of the gland by the time the diagnosis is made.

Summary

In the early diagnosis and proper treatment of cancer of the thyroid gland the best results are to be expected when a careful preoperative selection is made of patients with nodular goiter who are most liable to harbor malignant change. Any of the following should arouse suspicion: (1) recent growth, (2) solitary nodules, (3) nodular goiter in children, (4) "cold" nodules, (5) nodular non-toxic goiter in men, (6) lack of regression after hormone administration and (7) vocal cord paralysis.

Proper treatment consists of total surgical extirpation of the primary carcinoma and local metastatic lesions. The decision about the extent of thyroidectomy and glandular dissection should be made on an individual basis at the time of the original operation. By the use of cryostatic sections an immediate diagnosis can usually be made to guide the surgeon to the proper decision in each case.

At times when complete removal is not possible or there are distant metastatic lesions, internal or external radiation is often of benefit. In all cases, especially in younger patients, suppression therapy should be used postoperatively.

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REFERENCES

1. Astwood, E. B., Cassidy, C. E., and Aurbach, G. D.: Treatment of goiter and thyroid nodules with thyroid, J.A.M.A., 174:459-464, 1960.

2. Badillo, J., Shimaoka, K., Lessman, E. M., Marchetta, F. C., and Sokal, J. E.: Treatment of non-toxic goiter with sodium Liothyronine. A double-blind study, J.A.M.A., 184:29-36, 1963.

3. Bartels, E. C., Bell, G. O., and Geokas, M. C.: Evaluation of the thyroid nodule, Surg. Clin. No. Amer., 42:655-665, 1962.

4. Becker, F. O., Economou, P. B., and Schwartz, T. B.: The occurrence of carcinoma in "hot" thyroid nodules, Ann. Int. Med., 58:877-882, 1963.

5. Black, B. M.: Hyperparathyroidism, Charles C Thomas, Springfield, Ill., 1953.

6. Boggs, J. E., McCoy, R. W., and Gray, D. B.: Carcinoma of the thyroid, W. Va. Med. J., 58:163-169, 1962.

7. Bowens, O. M., and Vander, J. B.: Thyroid nodules and thyroid malignancy. The risk involved in delayed surgery, Ann. Int. Med., 57:245-253, 1962.

8. Buckwalter, J. A., and Mason, E. E.: Differences between childhood and adult thyroid carcinoma, Bull. Soc. Internat. Chir., 19:499-505, 1960.

9. Byrd, B. F., Jr., and McElhannon, F. M.: The influence of the incidence of thyroid malignancy on the selection of therapy in thyroid disease, South. Med. J., 54:518, 1961.

10. Castleman, B.: Tumors of the parathyroid glands. Section IV, Fasc. 15, Atlas of Tumor Pathology.

11. Clark, A. L.: Intraglandular dissemination of thyroid cancer, Proc. Fourth National Cancer Conf., 1960, p. 665.

12. Clark, R. L., White, E. C., and Russell, W. O.: Total thyroidectomy for cancer of the thyroid. Significance of intraglandular dissemination, Ann. Surg., 149:858-866, 1959.

13. Colcock, B. P., and Cattell, R. B.: Carcinoma of the thyroid, Surg. Clin. No. Amer., 42:687-691, 1962.

14. Dobyns, B. M.: Cancer of the thyroid: Radical surgery, radiation or hormonal suppression therapy, Surg. Clin. No. Amer., 42:481-492, 1962.

15. Dunhill, T.: The surgery of the thyroid gland, Trans. Med. Soc. Lond., 60:234-282, 1937.

16. Fowler, E. F.: The changing incidence and treatment of thyroid disease, Arch. Surg., 81:733-740, 1960.

17. Hamilton, J. G., Soley, M. H., and Eichorn, K. B.: Deposition of radioactive iodine in human thyroid tissue, Univ. Calif. Publ. Pharmacology (No. 48), 1:339-367, 1940.

18. Hayles, A. B., Johnson, L. M., Beahrs, O. H., and Woolner, L. B.: Carcinoma of the thyroid in children, Am. J. Surg., 106:735-743, 1964.

19. Hazard, J. B., Hawk, W. A., and Crile, G., Jr.: Medullary (solid) carcinoma of the thyroid. A clinicopathologic entity, J. Clin. Endoc. Metab., 19:152-161, 1959.

20. Lindsay, S.: Carcinoma of the thyroid gland, Charles C Thomas, Springfield, Ill., 1960.

21. MacDonald, I., and Kotin, P.: Surgical management of papillary carcinoma of the thyroid gland—the case for total thyroidectomy, Ann. Surg., 137:156-164, 1953.

22. Marchetta, F. C.: When is the thyroid nodule malignant, Geriatrics, 18:602-607, 1963.

23. Marjarakis, J. D., Slaughter, D. P., and Cole, W. H.: Carcinoma of the thyroid gland, J. Clin. Endoc. Metab., 13:1530-1541, 1953.

24. McCormack, K. R., Sheline, G. E.: Leukemia after radioiodine therapy for hyperthyroidism, Calif. Med., 98:207-209, 1963.

25. Meadows, P. M.: Scintillation scanning in the management of the clinically single thyroid nodule, J.A.M.A., 177:229-234, 1961.

26. Norris, E. H.: Carcinoma of the parathyroid glands with a preliminary report of 3 cases, Internat. Abstr. Surg., 86:1-21, 1948.

27. Norris, E. H.: Collective review. The parathyroid adenoma. A study of 322 cases, Internat. Abstr. Surg., 84:1-41, 1947.

28. Rose, R. G., Kelsey, M. P., Russell, W. O., Ibanez, M. L., White, E. C., and Clark, R. L.: Follow-up study of thyroid cancer treated by unilateral lobectomy, Am. J. Surg., 106:494-500, 1963.

29. Russell, W. O., Ibanez, M. L., Clark, R. L., and White, E. C.: Thyroid carcinoma. Classification, intraglandular dissemination, and clinicopathological study based upon whole organ sections of 80 glands, Cancer, 16:1425-1460, 1963.

30. Rustad, W. H., Lindsay, S., and Dailey, M. E.: Comparison of the incidence of complications following total and subtotal thyroidectomy for thyroid carcinoma, Surg., Gynec., & Obstet., 116:109-112, 1963.

31. Shimaoka, K., Badillo, J., Sokal, J. E., and Marchetta, F. C.: Clinical differentiation between thyroid cancer and benign goiter, J.A.M.A., 181:179-185, 1962.

32. Sieracki, J. C., and Horn, R. C., Jr.: Nonfunctional carcinoma of parathyroid, Cancer, 13:502-506, 1960.

33. Slater, S., and Lipton, S.: Preoperative numerical prediction of thyroid nodules, Arch. Surg., 85:176-179, 1960.

34. Thomas, C. G., Jr.: On the surgical management of thyroid cancer, South. Med. J., 52:260-266, 1959.

35. Thomas, C. G., Jr.: The use of L-triiodothyronine as a pituitary depressant in the management of thyroid cancer, Surg., Gynec. & Obstet., 106:137-144, 1958.

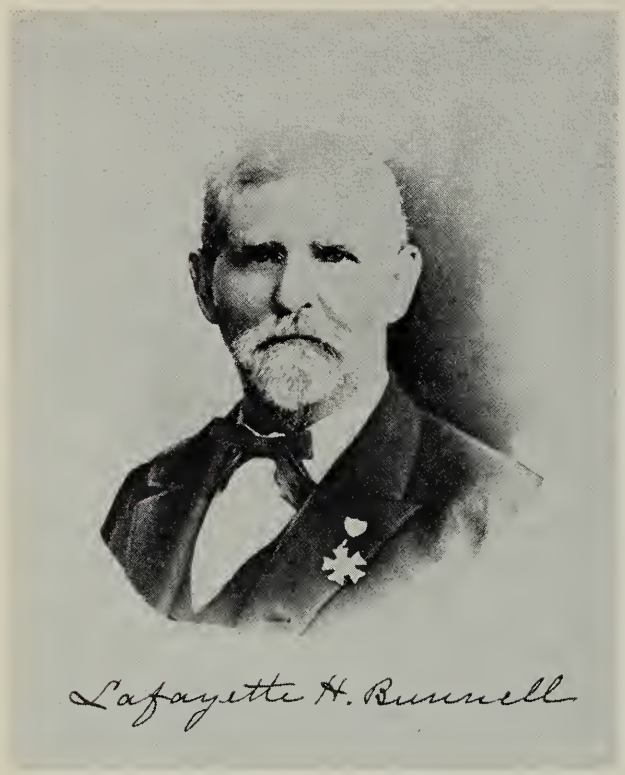
36. Tollefsen, H. R., and DeCosse, J. J.: Papillary carcinoma of the thyroid. Recurrence in the thyroid gland after surgical treatment, Am. J. Surg., 106:728-734, 1963.

37. Veith, F. J., Brooks, J. R., Grigsby, W. P., and Selenkow, H. A.: The nodular thyroid gland cancer, N.E.J.M., 270:431-436, 1964.

38. Ward, R.: New concepts in the treatment of carcinoma of the thyroid, J. Internat. Coll., Surg., 32:186-193, 1959.

39. Williams, A. C., Davis, J. M., and Kiely, A. A.: Thyroid cancer in 1,330 cases of surgical goiter, Am. J. Surg., 104:672-676, 1962.





DR. L. H. BUNNELL

and the Naming of Yosemite Valley

A Medical Footnote to California History

EDWARD SHAPIRO, M.D.
Beverly Hills

A CENTURY AGO, the first state park was created on June 30, 1864, when war-worried President Lincoln signed a bill that granted to California what is now Yosemite National Park. Since a doctor of medicine was present at its discovery and he chose its name, it is appropriate for a new generation of California physicians to recall Dr. L. H. Bunnell.

"Moral, political and financial night" was the characterization given California of the 1850's by H. H. Bancroft,[1] the noted historian. The sinful Indian War was going great guns. When James D. Savage's stores in Mariposa and Fresno were raided, a storekeeper killed and nearby a miner found dead and minus most of his skin, the owner appealed to the governor for arms to form the Mariposa Battalion. Savage was promptly elected major. Meanwhile, the Indian commissioners had curtailed much of the hostilities by negotiating treaties with all the nearby tribes, except the Yosemite Indians. This tribe was a gang of malcontents bound together not by blood or marriage but only by their own lawlessness.

The Mariposa Battalion consisted of adventurous volunteers, many of whom had served in the Mexican War a few years before. One of these veterans was a young physician named Lafayette Houghton Bunnell. He differed from his fellows in one major respect: he was singularly entranced by the magnificence of the Sierra. In March of 1851, when Major Savage marched his men over the mountains that protected the Yosemite Indians, the first white men entered the valley. Here is an account written by Dr. Bunnell, published in 1865 in James Hutchings' *Scenes of Wonder and Curiosity in California*[3]:

"It is acknowledged that Ah-wah-ne is the old Indian name for the valley, and that Ah-wah-nechee is the name of its original occupants; but this was discovered by the writer long after he had named the valley, and it was the wish of every volunteer with whom he conversed that the name of Yo-Semity be retained."

In 1880 Dr. Bunnell expanded this account in his book, *The Discovery of the Yosemite and the Indian War of 1851*[2]:

"I suggested that the valley should have an appropriate name . . . I did not like any of the names proposed and suggested that it would be better to give the valley an Indian name than to import a strange and inexpressive one; and that the name of the tribe who occupied it would be more appropriate than any which I had heard suggested. I then proposed that we give the valley the name of Yosemity, that to be doing so the name of the tribe of Indians which we met leaving their homes in the valley, perhaps never to return, would be perpetu-

From the Cedars of Lebanon Hospital, Los Angeles.
Submitted July 17, 1964.

ated . . . At the time its significance—grizzly bear —was not generally known to our battalion. Neither was it pronounced with uniformity. Savage, who could speak the dialects of most of the mountain tribes in this part of California, told us that the correct pronunciation was Yo-semity, and that it signified a full-grown grizzly; and that the name was given to old Tenieya's band because of their lawless and predatory character.

"The date of our discovery and entrance into the Yosemity Valley was about the 21st of March, 1851 . . .

"Lieutenant Moore, of the U.S.A., in his report of an expedition to the valley in 1852, substituted *e* as the terminal letter, in place of the *y* in use by us; no doubt thinking the use of the *e* more scholarly, or perhaps supposing Yosemite to be of Spanish derivation."

After the Mariposa Battalion was disbanded July 25, 1851, Dr. Bunnell remained in California for five years, trading and mining. He then returned to La Crosse, Michigan, where he enlisted in the Union Army, serving as a hospital steward and rising to army surgeon. Bunnell's medical training was not unusual for the place and times. When he was 16, he had reluctantly begun to study medicine in his father's office. A later precepteeship (with a Dr. Scovill of Detroit) was interrupted by a hitch in the Mexican War, where he soon found himself in charge of the regimental hospital. In 1864, he received an honorary M.D. from the La Crosse Medical College, based apparently on his military medical services. He practiced for some years in Homer, Minnesota. He died in 1903 in Winona, Minnesota.[4]

Ironically, no area in Yosemite National Park commemorates the name of Dr. Bunnell.

123 North San Vicente Boulevard, Beverly Hills, California 90211.

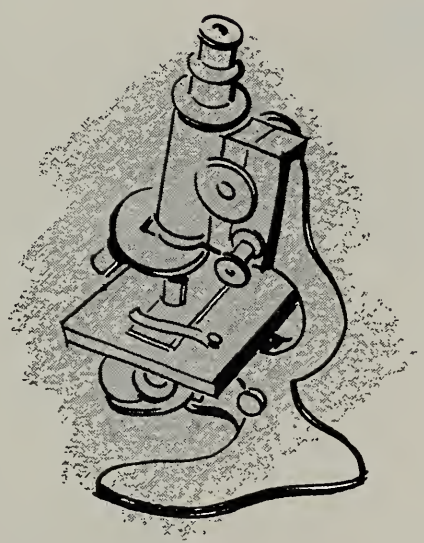
REFERENCES

1. Bancroft, H. H.: History of California, 1542-1890, San Francisco: History Company of San Francisco, 1886-1890, Vol. II.

2. Bunnell, L. H.: The Discovery of the Yosemite and the Indian War of 1851, Chicago, 1880, p. 273.

3. Hutchings, James: Scenes of Wonder and Curiosity in California, London, Chapman and Hall, 1865, pp. 75-76.

4. Kelly, H. A.: Lafayette Houghton Bunnell, M. D.: Discoverer of Yosemite, Ann. M. Hist., 3:179, 1921.



CASE REPORTS

Diabetic Acidosis and Severe Hyperlipemia with Remission

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Orange

DIABETES MELLITUS, in some instances, may not be due to a relative or an absolute deficiency of insulin. Remission of clinical diabetes mellitus is rare. The following case was unusual in both respects.

The patient, a 34-year-old Negro, was admitted for the first time to the Wadsworth General Hospital at 11 p.m. January 3, 1963. He had been in excellent health until, four weeks before admission, he noticed the onset of polydypsia, polyuria and nocturia. The latter symptom was extremely severe, occurring every 15 to 20 minutes. Polyphagia appeared a week before admission. Weakness, muscular cramping in all extremities and dizziness had been present for 24 hours when he was examined, and it was these symptoms that led him to seek medical help. During the four preceding weeks the body weight had decreased 50 pounds.

Submitted October 21, 1963.

The past history was not remarkable. Dietary history revealed that, before the onset of the present illness, the patient daily ingested approximately one loaf of bread, 20 hot dogs, 64 ounces of carbonated drink, eight to ten large potatoes, one quarter pound of butter, and salad. These foods provided 6,000 to 7,000 calories per day.

On physical examination the patient did not appear acutely ill. The blood pressure was 130/90 mm of mercury and the pulse rate was 80 per minute. The patient was six feet tall and weighed 182½ pounds. The fundi showed classical changes of lipemia retinalis. There were numerous furuncles on his posterior neck. No evidence was observed of disease of the pharynx, thyroid gland, heart, lungs, abdomen or extremities. No neurological abnormalities were noted. There were no xanthomata.

Laboratory Data

Initial studies showed blood glucose of 346 mg per 100 ml and a serum carbon dioxide combining power of 11 mEq per liter. The plasma acetone was 4+ in 1:4 dilution. Serum content of sodium was 115, of potassium 3.4 and of chloride 70 mEq per liter, respectively. Creatinine was 1.9 mg per 100 ml. The serum was thick and cream-colored. Total lipids were 18 gm per 100 ml. Urinalysis revealed a 4+ reaction for sugar and 4+ for acetone. Serum alkaline phosphatase (King-Armstrong units) values, determined soon after the patient was admitted to hospital and found to be elevated, decreased to normal during his stay. The exact cause of the elevation could not be determined. The abnormal electrolyte values quickly returned to normal after treatment (Table 1). Normal values were obtained for serum calcium, phosphorus, al-

TABLE 1.—*Results of Determinations*

	January								*February*
	3	*4*	*7*	*8*	*9*	*10*	*14*	*21*	*5*
Serum creatinine (mg/100 ml)	1.9		1.3		1.1				
Serum sodium (mEq/1)		115	130		128				
Serum potassium (mEq/1)		3.4	4.2		4.2				
Serum CO_2 (mEq/1)	11	14	17		23				
Serum chlorides (mEq/1)	70	87	97		100				
Alkaline phosphatase (King-Armstrong units)				61.6		41	13.8	9.3	9.9

bumin, globulin, uric acid, carotene, bilirubin, cephalin flocculation, thymol turbidity, prothrombin time, bromsulfalein, amylase, transaminase (SGOT), protein-bound iodine, hematocrit and erythrocyte and leukocyte count. Blood glucose values were determined frequently. During the early part of the stay in hospital, but after treatment had been initiated, the values were between 60 and 180 mg per 100 ml. There was no association of blood glucose values and lipid values. Results of radioactive iodine uptake studies were within normal limits.

Treatment

Soon after diagnosis was made, 100 units of crystalline insulin was given intravenously, followed by one-half normal saline solution parentically. Cramping in the right upper quadrant of the abdomen, which the patient had complained of soon after admission, and cramping of all extremities disappeared within three hours after treatment was begun. During the first 24 hours in hospital he received 165 units of crystalline insulin, two liters of fluids parenterally and three liters orally. The blood glucose decreased to 90 mg per 100 ml after six hours of treatment. On the second day in hospital the plasma was free of acetone; acetone was present in the urine until the ninth hospital day. On the third hospital day a diet containing 214 gm of carbohydrate, 104 gm of protein and 95 gm of fat was started (a total of 2,127 calories). The lipemia retinalis began to clear by the seventh day and by the eleventh day it had completely disappeared. The serum remained grossly lipemic until the twentieth hospital day. On the twenty-sixth hospital day the diet was changed to 351 gm of carbohydrate, 110 gm of protein and 40 gm of fat (2,204 calories). The insulin dose was reduced gradually because of postprandial complaints of weakness and tremulousness. These symptoms were associated with low blood glucose values. By the thirty-ninth hospital day, no insulin was required (Chart 1). During hospitalization the patient's weight varied between 182 and 188 pounds. He was discharged 55 days after admission with prescription of a high carbohydrate and low fat diet.

TABLE 2.—*Determinations of Lipids, Cholesterol and Glucose of Mother and Siblings of Patient*

	Total Lipids (mg per 100 ml)	*Cholesterol (mg per 100 ml)*	*Glucose (mg per 100 ml)*
Mother—fasting	720	370	135
Mother—4 hours postprandial	1760	399	190
Brother—2 hours postprandial	930	124	110
Sister—fasting	600	140	88

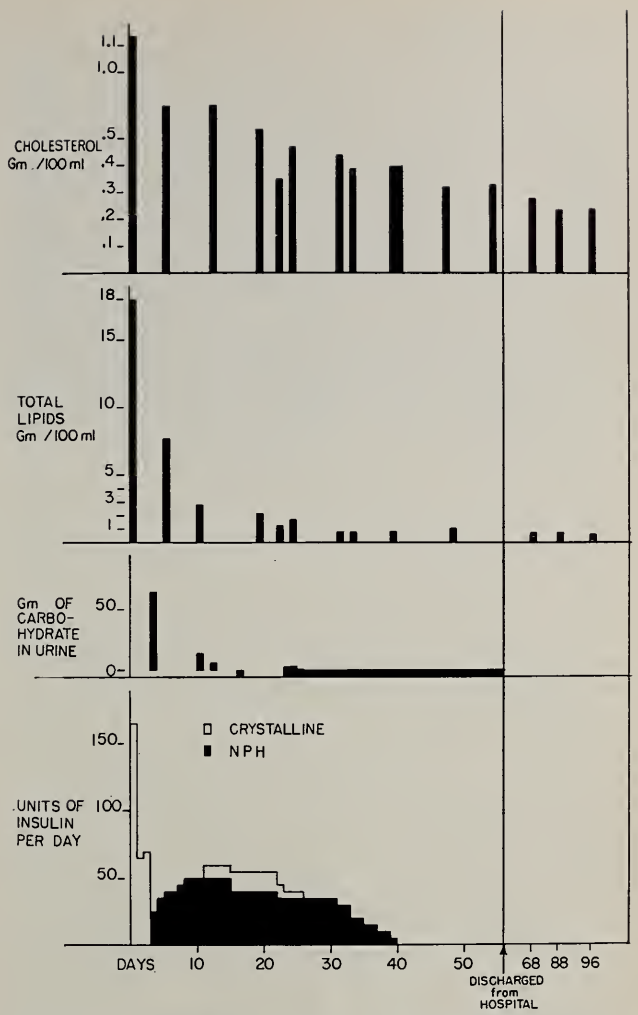


Chart 1.—Changes in total lipids, cholesterol, grams of carbohydrate in urine, and insulin requirements from day of admission to 96th day of illness. Note total lipid value of 18 gms per 100 ml on admission.

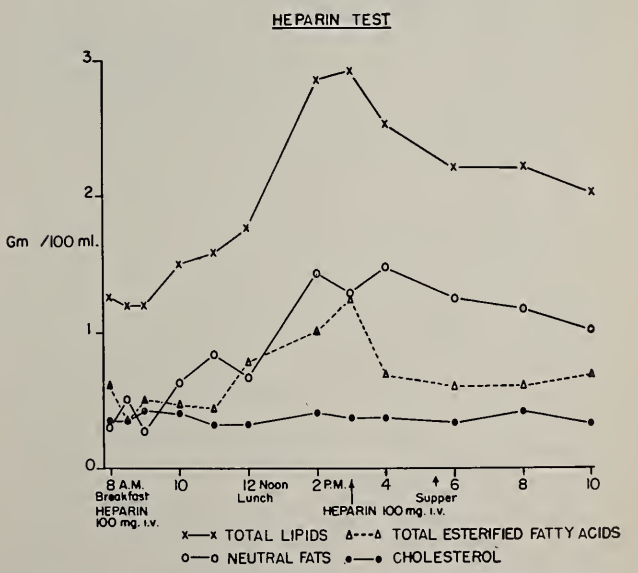


Chart 2.—Changes in serum of total lipids, total esterified fatty acids, neutral fats, and cholesterol following intravenous heparin injections. Changes are not remarkable, probably indicating no deficiency of a fat-clearing factor. (I.V.=intravenous.)

Special Studies

Lipid. At the time the patient entered the hospital the serum was examined for total lipids—total esterified fatty acids, total cholesterol, lipid phosphorus, and neutral fats. Determinations were repeated on subsequent days. The serum of the patient's two siblings and mother also was examined (Table 2). On January 26, at 8 a.m., after the patient had received 10 units of crystalline insulin and 35 units of NPH insulin, and had eaten breakfast, he was given 100 mg of heparin intravenously. This dosage was repeated at 3 p.m. Numerous determinations were made that day for various lipid fractions. Total lipids and total cholesterol determinations also were made on several following days and also after discharge (See Charts 1 and 2). Lipid phosphorus on admission was 51 mg per 100 ml; thereafter these values were within normal limits when determined, and are not charted.

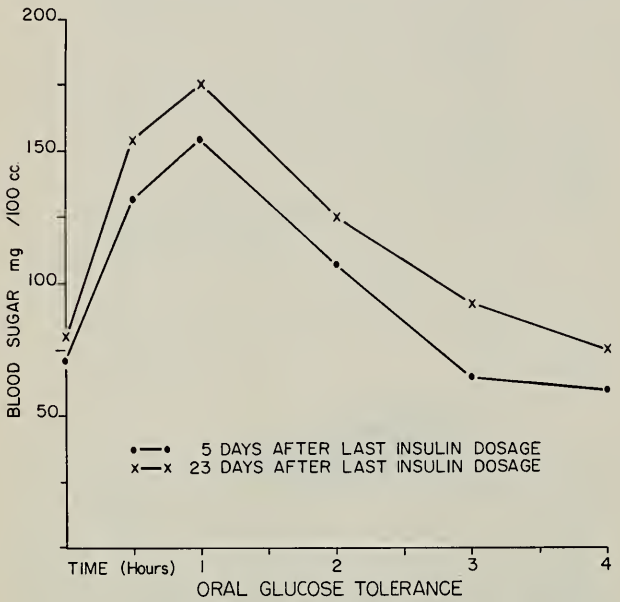


Chart 3.—Results of oral glucose tolerance tests five days following last insulin injection and twenty-three days following last insulin injection.

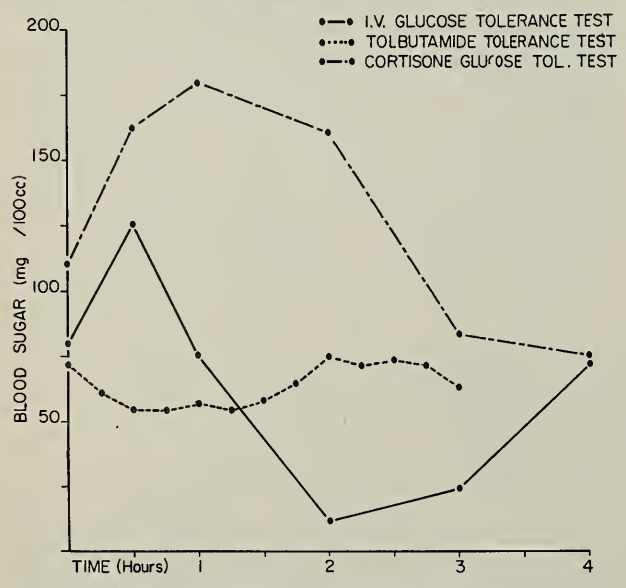


Chart 4.—Various loading tolerance tests. Note that the results of cortisone and tolbutamide tolerance tests are those of a diabetic person (I.V. = intravenous.)

Glucose Tolerance Tests. After the patient had not required insulin for at least five days, and in the immediate period thereafter, two oral glucose tolerance tests, an intravenous glucose tolerance test, a cortisone glucose tolerance test and a tolbutamide tolerance test were performed. The patient was prepared for all of these tests by receiving at least 300 gm of carbohydrate daily for at least three days beforehand. The oral glucose tolerance tests were performed in the routine manner with the patient, after fasting overnight, receiving 100 gm of glucose in 250 ml of water. Specimens for blood glucose were taken at 0 hour, one-half hour, two hours, three hours and four hours after the glucose ingestion (Chart 3). For the intravenous glucose tolerance test, glucose was given intravenously to the fasting patient as a 20 per cent solution, 0.5 gm per kilogram of body weight, over a one-half hour period. Blood for glucose determination was taken before the infusion, at one-half hour, one hour and then every hour until four hours had elapsed from the start of the infusion (Chart 4). The cortisone glucose tolerance test was performed exactly as the oral glucose tolerance tests with the additional loading of 62.5 mg of cortisone eight and one-half hours and 62.5 mg cortisone two hours preceding the oral glucose load (Chart 4). The tolbutamide test was performed as follows: 1 gm of tolbutamide dissolved in 20 cc of diluent was given to the fasting patient intravenously and specimens of blood for glucose determinations were taken at 0 hours and every 15 minutes until three hours had elapsed (Chart 4). Glucose determinations were made by the oxidase method.[30]

Serum Insulin-Like Activity Assays. Blood specimens were obtained in the fasting state and at the same intervals following ingestion of 100 gm of glucose as the specimens obtained for the second oral glucose tolerance test. The admitting lipemic serum (Jan. 3, 1963), taken before insulin therapy was started, and the serum from the second glucose tolerance test (March 7, 1963) were assayed for insulin-like activity. The assay technique has been described in detail.[5,6,7] Glucose uptake of rat epididymal adipose tissue, measured following two hours of incubation at 36.5°C, has been calculated as the difference between the uptake (mg of glucose per gram of adipose tissue), computed as $\log_{10}$, of an individual serum plus buffer controls incubated with adipose tissue from the same rat (Table 3).

TABLE 3.—*Mean ± Standard Error of the Mean (Mg of Glucose per gram of Fat Uptake)**

Serum Dilution	*Control*	*On Admission 1/3/63*	*Fasting 3/7/63*	*½ Hour*	*1 Hour*	*2 Hours*	*3 Hours*	*4 Hours*
1 to 10	5.80±	13.89±	7.30±	7.08±	1.15	1.73	1.83	1.66
	0.64	2.03	1.72	1.58	6.34±	3.78±	5.26±	8.07±
1 to 30	4.56±	7.47±	4.99±	5.04±	0.64	0.54	0.73	1.13
	0.36	1.75	0.81	0.69	6.57±	7.68±	6.66±	12.09±

*See text Comment on page 474.

Results

The lipid studies on the admission ketotic serum showed all fractions to be decidedly elevated (Chart 1). Significant reduction in the hyperlipemia was accomplished with insulin and a diabetic diet. Return of cholesterol values to normal did not occur until weeks following discharge of the patient from the hospital. There was no correlation between elevated lipid values and glucose values. Heparin had no effect on neutral fats but did decrease the total esterified fatty acids to some extent. The other lipid fractions were not affected by the heparin (Chart 2).

The mother's serum showed an alimentary hyperlipemia and hypercholesteremia. Her glucose determinations were indicative of diabetes mellitus, although clinically she was asymptomatic. Results of serum determinations in the patient's siblings were not remarkable (Table 2).

The first oral glucose tolerance test was normal.[13] The second was slightly abnormal. The intravenous glucose tolerance test was decidedly abnormal. The cortisone glucose tolerance also must be considered abnormal.[15] The tolbutamide test was the most abnormal of all.[46]

The serum obtained on admission and the serum obtained during the second oral glucose tolerance test showed insulin-like activity. The serum on admission and that obtained after the glucose tolerance test showed the highest insulin-like activity. The activity in the one-tenth dilution of fasting serum seemed higher than would be expected. The 1 to 3 hour post-glucose specimens of serum did not show the normal rise above the fasting levels of insulin-like activity.

Review of the Literature

Although extremely rare, there are patients with diabetes mellitus who undergo remissions with permanent cure. Very few cases reported in the literature would meet Joslin's[28] requirements, to which cures from diabetes should conform. John,[26] in 1925, reported a patient with diabetes mellitus, who also had acromegaly, and only after treatment of the acromegaly did the diabetes remit. Nine cases of recovery from diabetes mellitus were described by Leyton[34] in 1930. There was no long term follow-up of these cases and the data supporting the cures were sparse. Obese glycosurics, over the age of 30, were studied by Newburgh and Conn.[37] After the weight of these patients had been reduced to normal by simple underfeeding, they remained aglycosuric, did not become hyperglycemic when they were placed on maintenance diets containing 300 gm of carbohydrate and exhibited normal glucose tolerance curves. Recurrence of the obesity was capable of reproducing the hyperglycemia and the delayed utilization of dextrose. Subsequent reduction of weight again corrected the disturbance in the metabolism of carbohydrate.

In 1953, Cheng and coworkers[10] reported a 68-year-old Negro woman, who was admitted to hospital in coma, with blood sugar of 1170 mg per 100 ml, requiring 1425 units of regular insulin and 10,350 ml of fluids during the first 24 hours of therapy. She eventually required no insulin, but no long-term follow up was given by the authors. Duncan[14] described a case of diabetes mellitus disappearing after removal of a pheochromocytoma. From a study of 517 diabetics, Lukens and Dohan[32] were able to show 19 who had remissions of from one month to ten years. Seventeen of the 19 were treated vigorously within the first four months of the disease. None of these patients were in acidosis initially. Hartman[22] reported two juvenile diabetics who initially responded to treatment and for several months required no insulin, only later to require insulin permanently.

Harwood,[23] in 1957, reported the case history of a young man who, on recovery from diabetic acidosis, soon had a remission that permitted him to live on a mildly restricted diet without insulin up to the time of publication, 23 months later. In 1953 two cases of acute episodes of diabetes mellitus were discussed briefly.[27] The first case followed excessive consumption of carbohydrate, with a rapid gain in weight; on diet alone, the patient had a remission for 17 years. The second case was that of a patient with chronic relapsing pancreatitis, whose sudden episode of diabetic acidosis was followed by a remission of at least eight months. A diabetic syndrome was described by Wells[49] in Singapore, characterized by pronounced insulin insensitivity and

periods of complete or partial remission. Of the eight patients described, all but two had relapse. These two had remissions for three years. Stutman and coworkers[43] in 1959 reported the case of a young man with diabetic ketoacidosis with apparent remission. Severe infection several months after he had an apparent remission from the diabetic acidosis, did not bring on the symptoms of diabetes. Both the provocative cortisone and intravenous tolbutamide tolerance tests, however, were positive for latent diabetes long after the patient was in a state of clinical remission.

Taylor,[44] in 1960, reported a 33-year-old man with severe diabetes who required no insulin after two months of treatment. Insulin activity was found in the ketotic and remission serum.

A 41-year-old man, who was first seen in severe diabetic coma, was described by Peck and coworkers.[38] There was no history of diabetes until the onset of illness one day before admission, when the patient was found unconscious. On admission, blood glucose was 1280 mg per 100 ml, CO_2 was 3 mEq per liter, and the patient was in circulatory collapse. In the next 12 hours 1910 units of regular insulin was given and subsequently insulin resistance developed requiring 200 to 400 units of insulin daily in order to maintain normal glycemia. After ten days in the hospital, responsiveness to insulin suddenly improved and severe hypoglycemia ensued. Forty-six days after admission, no insulin was required. The Fajans-Conn cortisone glucose tolerance test was not indicative of latent diabetes. Endocrine and metabolic studies were unrevealing. Tullock and Lambert[45] presented the records of 12 patients in whom the clinical and biochemical manifestations of diabetes mellitus were of limited duration. Six presented in diabetic coma or precoma. All were followed for periods varying for 11 to 77 months. Five had relapsed. Three, who had not relapsed, no longer adhered to a "diabetic diet." All were considered to be or to have been in a latent phase of diabetes.

The author could not find, in the literature, any case similar to the one presented in his case report. Diabetic acidosis and severe hyperlipemia followed by a remission had not been reported.

Discussion

Studies of the pathologic features of diabetes and of the experimental production of the disease in animals are necessary for any attempt at an understanding of remissions in diabetes. In dogs, it has been known for some time that pancreatectomy, sufficient to cause the production of diabetes, was accompanied by progressive degranulation and hydropic degeneration of the beta cells of the islands of Langerhans in the remaining pancreatic remnant; these changes were reversible if the animal was given insulin or fasted but were progressive if the animal was overfed.[3,11] Injections of anterior pituitary extracts were found to cause temporary or permanent diabetes in dogs, depending upon the number and the amount of injections.[51] If the anterior pituitary injections were not continued for too long a period, restoration to normal was seen histologically.[41] In the human pancreas, evidence of regeneration had been noted previously, chiefly in the pancreas of diabetic persons who died of acute toxic illness.[47] It was demonstrated in a cat, made unquestionably diabetic by partial pancreatectomy and injections of anterior pituitary extract, that the diabetic condition could be cured by the administration of insulin, but the cells did not recover if the administration had been too long delayed.[33] It was felt by most investigators that factors leading to overactivity of the pancreas may produce permanent changes. The resting procedure prevented the degenerative changes from occurring in pancreatic islet cells which still retain their ability to recover.[19]

Metz showed that normal dog pancreas has an enormous capacity to increase rapidly the supply of insulin to the body.[35] If the human pancreas is similarly constituted, it seems not unlikely that the prediabetic and mild diabetic states could be an expression of an impairment of this capacity. This speculation receives support from the work of Wrenshall and coworkers,[50] who showed that appreciable, and even in some cases normal, quantities may be extracted from the pancreas in maturity-onset diabetes. These investigators also found in diabetic subjects whose diabetes was discovered during the normal period of growth, that the extractable insulin of the pancreas was very low in comparison with that in nondiabetic control subjects. Little demonstrable correlation could be found between the extractable insulin of pancreas in the maturity-onset diabetic subjects and the duration of diabetes, the presence of prolonged hyperglycemia or the type of therapy.[50]

In the absence of demonstrable insulin resistance, the extractable insulin of the pancreas at autopsy in eight cases of diabetic coma was found to be extremely low. Metz[35] showed that the rate of insulin secretion in dogs was found to be a continuous function of the blood sugar level, falling as low as 0.2 micrograms per minute and rising as high as 40 micrograms per minute in severe hyperglycemia. A fourfold increase in the glucose concentration might result in a tenfold increase in the quantity of insulin liberated. This response of the pancreas to blood sugar concentration may well serve as a negative feedback loop in the regulation of the blood sugar level.

As interesting as was the remission of diabetes mellitus in the present case, the hyperlipemia that accompanied the acidosis also warranted attention. In diabetic acidosis, carbohydrate combustion and the formation of fat from carbohydrate appear to be reduced to minimal proportions. The subject is compelled to subsist almost entirely on fat. When carbohydrate metabolism is defective, there is increased mobilization of free fatty acids from adipose tissue; therefore, the quantity of free fatty acids carried to the liver is increased. Here they are disposed of through two pathways[17]: They may be converted to ketone bodies which are released into the general circulation for peripheral utilization or they may appear in the serum, primarily in the Sf 10-400 lipo-protein fraction. Fredrickson and Gordon[16] indicated that conditions inhibiting carbohydrate utilization decrease the rate of uptake of esterified lipids, either in the form of chylomicrons or fat emulsions from the blood. It may be that removal of neutral fat and other free lipids by the liver or other tissues is impaired, but this could hardly explain the rapid accumulation of these materials in the blood unless their production was also increased.[21] In Hamwi's[20] group of diabetic patients, relatively more free fatty acids were converted to triglycerides. The patients in whom extreme hyperlipemia develops with uncontrolled diabetes may be at one end of a spectrum (the patient in the present case is in the group) and diabetics who evidence extreme susceptibility to ketoacidosis, at the other. Although the differences in hepatic disposal of free fatty acids may represent intrinsic variations in hepatic tissue from individual to individual, it is also possible they represent differences in hormonal control.[20] Gilman[17] showed in baboons, after removal of pancreas and hypophysis, that ketonemia may be dissociated from hyperglycemia and hyperlipemia and one of the controlling factors may be of hypophyseal origin. The elevated cholesterol values at the time of admission in the case herein reported may be explained by the overwhelming amounts of acetyl coenzyme A produced in the liver and by the fact that increased quantities of acetoacetate also were present, due to the limitation of oxaloacetate.[18]

Steiger's[42] work may have a definite bearing on the present case. Sustained hyperlipemia was induced in two patients who were given daily injections of plasma dialysate containing lipid mobilizing activity (LM). Further studies with LM in man[52,53] indicated that prefeeding modified the individual's response to this stimulus. Test meals of glucose or cream in experiments abolished the effect of a single injection of LM; somehow glucose administration helped the liver to handle the triglyceride load brought about by LM. It is interesting that the mobilization lipemia occurring in response to LM was not cleared by heparin.[42] Such was the case, also, in the patient herein reported upon. On the other hand, heparin appears to clear alimentary lipemia through activation of a clearing factor (lipoprotein lipase). The patient in the present case had no such defect.

Treatment

It is apparent that adequate control of diabetes is of primary and major importance in correcting the lipid abnormalities in uncontrolled diabetes. Control of the blood sugar does not completely correct the lipid abnormalities. In the patients reported by Hamwi and coworkers[20] lipid values were restored to normal only with inclusion of a relatively and absolutely large amount of polyunsaturated fat in the diet. Before the advent of insulin, it became evident that if diabetes was not too severe the patient could be kept alive by diet alone, provided the intake of calories and of carbohydrate were restricted.[4] After insulin became available, Joslin advocated a moderate carbohydrate and moderate fat intake. Adlersberg and Porges[1] and Rabinowitch[39,40] prescribed a high carbohydrate and low fat regimen. Subsequent studies established that within certain limits the ratio of the carbohydrate, fat and protein were not as important as the total caloric intake.[12] Thus, it has been demonstrated that changing the fatty acid-dextrose ratio of the diet without altering total calories had no discernible effect on the fasting blood sugar and the insulin requirement.[42]

Triglycerides are the first lipid fraction to be affected by lack of control of diabetes. Carbohydrate metabolism has an influence on serum triglyceride in normal individuals as well as in those with diabetes.[2] Several studies have shown that high carbohydrate diets caused insulin-treated diabetic persons to exhibit a hyperlipemic response.[9] It has been shown that in many patients with essential hypertension who had been maintained on rice diets (85 to 95 per cent carbohydrate) for several months, a neutral fat lipemia develops.[24] Diets high in carbohydrate and low in fat can cause an increase in triglyceride concentrations in healthy persons.[48] Jacobs[25] stated that, in diabetes mellitus, lactescent serum is seen only in the presence of hyperglycemia and ketosis with rare exceptions. His observations differed from conditions observed in the present case.

Comment

At the time this communication was written the patient had not required insulin for two months. For the preceding two and a half months he had

been eating a high carbohydrate diet but the total caloric intake was far less than before the acute onset of diabetes. The patient checked his urine 2 to 4 times daily and reported that it never gave a positive reaction for sugar. Blood glucose determinations, either fasting or two hours after meals, were carried out at least weekly and were always within normal limits. The patient's weight varied between 180 and 185 pounds. During an acute episode of a severe upper respiratory infection, there was no sugar in his urine, and the blood glucose determinations were within normal limits. The patient tolerated the high carbohydrate diet extremely well, showing a decrease in the total lipid and cholesterol values to normal levels.

The majority of the glucose tolerance tests indicate that the patient is diabetic. The insulin-like assays cannot be explained. Beigelman[8] showed that patients with untreated, nonketotic, adult-onset diabetes appeared to have normal or elevated fasting levels of serum insulin-like activity, but responded to feeding with significantly lower insulin-like activity than normal in the postprandial state. Beigelman also showed that patients with previously unknown, untreated, severely ketotic (juvenile) diabetes had elevated serum insulin-like activity. Such was the case in our patient. It is probable that he has an inappropriate secretion of pancreatic insulin. The exact reason for his becoming acidotic is not known. For some unexplained reason, the insulin could not act on the tissue cell, thereby inhibiting the utilization of carbohydrate.

Summary

A study of a young adult man with acute onset of clinical diabetes mellitus is presented. He was first seen in acidosis and his serum was found to be decidedly lipemic. On diet and insulin, the lipemia cleared and total lipids and cholesterol values eventually returned to normal. A remission of the diabetes occurred. The ketotic serum and serum during remission showed insulin-like activity.

Addendum: The patient could not be seen again as he had left Southern California, but blood chemical studies were carried out at the University of California Medical Center, San Francisco, 11 months after his last observation by me. At this time total lipids were 806 mg per 100 ml, cholesterol 239 mg per 100 ml and fasting blood sugar was 134 mg per 100 ml.

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REFERENCES

1. Adlersberg, D., and Porges, O.: Uber die D iatbehandlung Kost; Kohlehydratmastkuren bei Unternahrten Zuckerkranken. Klin Wehnschr., 7:1503, 1928.

2. Albrink, M. J., and Man, E. B.: Serum triglycerides in health and diabetes, Diabetes, 7:194, 1958.

3. Allen, F. M.: Studies Concerning Glycosuria and Diabetes, Cambridge (Mass.), Harvard University Press, 1913.

4. Allen, F. M.: The Pathology of Diabetes: 5. The influence of circulatory alterations upon experimental diabetes, J. Metab. Res., 1:89, 1922.

5. Beigelman, P. M.: Insulin-like activity of normal and diabetic human serum, Diabetes, 8:29, 1959.

6. Beigelman, P. M.: Bio-assay for insulin-like activity utilizing glucose uptake by rat epididymal adipose tissue, Metabolism, 9:580, 1960.

7. Beigelman, P. M.: Human serum insulin-like activity as determined by a rat adipose tissue bio-assay method, Diabetes, 10:130, 1961.

8. Beigelman, P. M., and Tranquada, R. E.: Serum insulin-like activity in untreated diabetes, Diabetes, 11:179, 1962.

9. Bierman, E. L., and Hamlin, J. T.: The hyperlipemic effect of a low-fat, high CHO diet in diabetic subjects. Diabetes, 10:432, 1961.

10. Cheng, T. O., Jahraus, R. C., and Traut, E. F.: Extreme hyperglycemia and severe ketosis with spontaneous remission of diabetes mellitus, J.A.M.A., 152:1531, 1953.

11. Copp, E. F. F., and Barclay, H. J.: The restoration of hydropically degenerated cells of the pancreatic islands in dogs under insulin treatment, J. Metab. Res., 4:44, 1923.

12. Danowski, L. S.: Therapy of Diabetes: Food and Diets, Chapter 15, Diabetes Mellitus, Williams and Wilkins, Baltimore, 1957.

13. Duncan, G. G.: Diseases of Metabolism, W. B. Saunders Co., Philadelphia, 1959, p. 799.

14. Duncan, L. E., Jr., Semans, J. H., and Howard, J. E.: Adrenal medullary tumor, (Pheochromocytoma) and diabetes mellitus: Disappearance of diabetes after removal of tumor. Ann. Int. Med., 20:815, 1944.

15. Fajans, S. S., and Conn, J. W.: An approach to the prediction of diabetes mellitus by modification of the glucose tolerance test with cortisone, Diabetes, 3:296, 1954.

16. Fredrickson, D. D., and Gordon, R. S., Jr.: Transport of fatty acids, Physiol. Rev., 38:585, 1958.

17. Gillman, J., Gilbert, C. and Allan, J. C.: The relationship of hyperglycemia to hyperlipemia and ketoanemia in depancreatized baboons (Papio ursinus), J. Endocrinol., 17:349, 1958.

18. Gurin, S.: Normal lipid metabolism, Diabetes, 4:182, 1955.

19. Haist, R. E., Campbell, J., and Best, C. H.: The prevention of diabetes, N.E.J.M., 223:607, 1940.

20. Hamwi, G. J., Osvaldo, G., Kruger, F. A., Gwinup, G., and Cornwell, D. G.: Hyperlipidemia in uncontrolled diabetes, Metabolism, 11:850, 1962.

21. Harris, L. V. D., Albrink, M. G., VanEck, W. F., Man, E. B., and Peters, J. P.: Serum lipids in diabetic acidosis, Metabolism, 2:120, 1953.

22. Hartmann, A. F.: Fat Metabolism (Report of Twelfth M & R Pediatric Research Conference), 73 pp., Columbus, Ohio, M & R Laboratories, 1954, p. 19.

23. Harwood, R.: Severe diabetes with remission, N.E.J.M., 257:257, 1957.

24. Hatch, F. T., Abell, L. L., and Kendall, F. E.: Effects of restriction of dietary fat in cholesterol upon serum lipids and lipoproteins in patients with hypertension, Am. J. Med., 19:48, 1955.

25. Jacob, D. R.: Familial defect in lipid metabolism masked by diabetic hyperlipemia, J. of Mt. Sinai Hospital, 27:512, 1960.

26. John, H. J.: Spontaneous disappearance of diabetes, J.A.M.A., 85:1629, 1925.

27. Johnson, W. M.: Acute diabetic episode with remissions, N.E.J.M., 258:234, 1958.

28. Joslin, E. P., Root, H. F., White, P., and Marble, A.: The Treatment of Diabetes Mellitus, Lea and Febiger, Philadelphia, 1959, p. 241.

29. Kingsley, G. R.: Total lipids: Method of analyses, Am. Assoc. of Official Agr. Chem., p. 337, 1944.

30. Kingsley, G. R., and Getchell, G.: Direct ultramicro glucose oxidase method for determination of glucose in biological fluids, Clin. Chem., 6:466, 1960.

31. Kingsley, G. R., and Schaffert, J.: Serum cholesterol fractionation, Biol. Chem., 180:315, 1949.

32. Lukens, F. D. W., and Dohan, F. C.: Remission of diabetes mellitus, Penn. Med. J., 48:24, 1944-1945.

33. Lukens, F. D. W., and Dohan, F. C.: Morphological and functional recovery of the pancreatic islands in diabetic cats treated with insulin, Science, 92:222, 1940.

34. Lyton, O,: Nine cases of recovery from diabetes mellitus, Proceedings of the Royal Society of Medicine (Sect. Med), 23:37, 1930.

35. Metz, R.: The effect of blood glucose concentration on insulin output, Diabetes, 9:89, 1960.

36. Morgan, D. M., and Kingsbury, K. J.: Determination of total esterified fatty acids in blood serum, The Analyst. 84:409, 1959.

37. Newburgh, L. H., and Conn, J. W.: A new interpretation in obese middle-aged persons, J.A.M.A., 112:7, 1939.

38. Peck, F. B., Jr., Kirtley, W. R., and Peck, F. B., Sr.: Complete remission of severe diabetes, Diabetes, 7:93, 1958.

39. Rabinowitch, I. M.: Unusual fat metabolism in a case of diabetes mellitus, Am. J. Med. Sc., 176:489, 1928.

40. Rabinowitch, I. M.: Clinical and laboratory experiences with high carbohydrate, low calorie diets in treatment of diabetes mellitus, N.E.J.M., 204:799, 1931.

41. Richardson, K. C., and Young, F. G.: Histology of diabetes induced in dogs by injection of anterior pituitary extracts, Lancet, 1:1098, 1938

42. Steiger, W. A., Zarafonetis, C. J. D., Miller, G. M., Seifter, J., and Baeder, D.: Preliminary report on the effects of a plasma lipid mobilizing factor in man, Am J. Med. Sc., 232:605, 1956.

43. Stutman, L. J., and Hayes, J. D.: Severe diabetes with remission—Report of a case, Diabetes, 8:189, 1959.

44. Taylor, K. W.: Serum insulin in a case of severe diabetes mellitus showing remission, Brit. Med. J., 2:1853, 1960.

45. Tullock, J. A., and Lambert, C. C.: Latent diabetes, Diabetes, 10:207, 1961.

46. Unger, R. H., and Madison, L. L.: Comparison of response to intravenously administered sodium tolbutamide in mild diabetic and nondiabetic subjects, J. Clin. Invest., 37:627, 1958.

47. Warren, S., and Root, H. F.: The pathology of diabetes with special reference to pancreatic regeneration, Am. J. Path.. 1:415, 1925.

48. Watkins, D. M., Froeb, H. F., Hatch, F. T., and Gutman, A. B.: Effects of diet in essential hypertension. II. Results with unmodified Kempner rice diet in 50 hospitalized patients, Am. J. Med., 9:441, 1950.

49. Wells, R.: Remittent insulin-insensitive diabetes, Brit. Med. J., 2:1328, 1958.

50. Wrenshall, G. A., Bogoch, A., and Ritchie, B. C.: Extractable insulin of pancreas, Diabetes, 1:87, 1952.

51. Young, F. G.: The anterior pituitary gland and diabetes mellitus, N.E.J.M., 221:635, 1939.

52. Zarafonetis, C. J. D., Miller, G. M., Seifter, J., and Baeder, D.: Effect of prefeeding on the acute response to lipid mobilizer hormone in man, Am. J. Med. Sc., 235:410, 1958.

53. Zarafonetis, C. J. D., Miller, G. M., Seifter, Jr., Baeder, D., Myerson, R. M., and Steiger, W. A.: Metabolic studies in patients receiving lipid mobilizer hormone, Am. J. Med. Sc., 234:493, 1957.

54. Zilversmit, D. B., and Davis, A. K.: Microdetermination of lipid phosphorus, J. Lab. Clin. Med., 35:155, 1950.

Pneumoencephalographic Findings in Coccidioidal Meningoencephalitis

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Improvements in laboratory diagnosis has led to an increasing frequency of reports of coccidioidal meningoencephalitis in the recent literature. Sometimes, however, laboratory findings are not conclusive and coccidioidal meningoencephalitis may present a clinical picture simulating other pathologic processes, including neoplastic lesions. In such instances, a pneumoencephalographic study may be necessary for differential diagnosis, for prompt diagnosis and early initiation of amphotericinotherapy may enhance the chance of recovery.

The present communication concerns a case of coccidioidal meningoencephalitis with particular reference to the pneumoencephalographic appearance characteristic of this disease.

Submitted December 19, 1963.

From the Neurosurgical Service, Department of Surgery, Kaiser Foundation Hospital, Los Angeles.

Report of a Case

A 53-year-old man became ill in April 1961, with complaint first of a mild upper gastrointestinal upset and then, a day or two later, dry coughing. He had been treated by a physician as having "walking pneumonia." Two or three weeks after the onset of illness, he began to have generalized persistent headaches of fluctuating intensity. The headaches lasted about two months. In June 1961, the patient had an episode of sudden inability to speak that lasted a few minutes. During the next four months he had four episodes of momentary loss of consciousness followed by transitory aphasia and right hemiparesis. Meanwhile, bilateral irregular

tremors of both hands developed, and gradual mental deterioration was noted. He was admitted to hospital in October 1961.

On neurological examination, evidence of mild organic mental syndrome was observed. The cranial nerves were intact. The patient's memory was poor, he could not deal with simple problems in arithmetic, he was unable to follow complicated commands and he was confused as to body parts. His speech appeared normal. Course tremors were noted in both hands. There was no motor weakness of the limbs. Responses to tests indicated the sensory sphere was intact. There was no evidence of cerebellar dysfunction. Hyperreflexia was noted in all extremities.

Spinal fluid pressure was within normal range. The cerebrospinal fluid was clear but slightly xanthochromic, containing 382 mononuclear leukocytes. The total protein content was 488 mg per ml and sugar content 22 mg per 100 ml. Repeated cultures were sterile. There was no fungus or yeast noted in specimens of the fluid. Results of serologic tests and complement-fixation tests of the spinal fluid were strongly positive for coccidioidomycosis. An electroencephalogram showed diffuse dysrhythmia of moderate severity.

A pneumoencephalogram five days after admission showed asymmetrical accumulation of subarachnoid air, more prominent over the left cerebral hemisphere. The pockets of subarachnoid air were circular or lobulated and were joined in clusters like small soap bubbles scattered over the anterior convexity, more on the left than the right side (Figure 1).

The patient was treated intensively with amphotericin B, a total of 70 mg being given intravenously and 30 mg intrathecally in 22 days. The condition of the patient slowly deteriorated. In October 1961 signs of hypothalamic dysfunction developed. He became lethargic and hyperpyrexic, with profuse perspiration. He died six months after the onset of illness.

The brain showed evidence of extensive meningitis. The leptomeninges were decidedly thickened, both at the base and over the convexities of the brain. There were many small granulomata scattered in the leptomeninges, especially in the anterior portion of the Sylvian fissure. The largest granuloma, 1.5 by 1 cm, was in the area of the anterior hypothalamus (Figure 2). The sulci were generally widened. Multiple small loculated cysts filled with thick exudates were noted over the surface of the cerebrum. An area of softening was present in the left basal ganglia and the hypothalamus.

Microscopically, there was evidence of diffuse granulomatous meningitis with pronounced thickening of the leptomeninges, and massive infiltrations of acute and chronic inflammatory cells. Also noted were large numbers of multinucleated giant cells, many of which contained thick-walled round

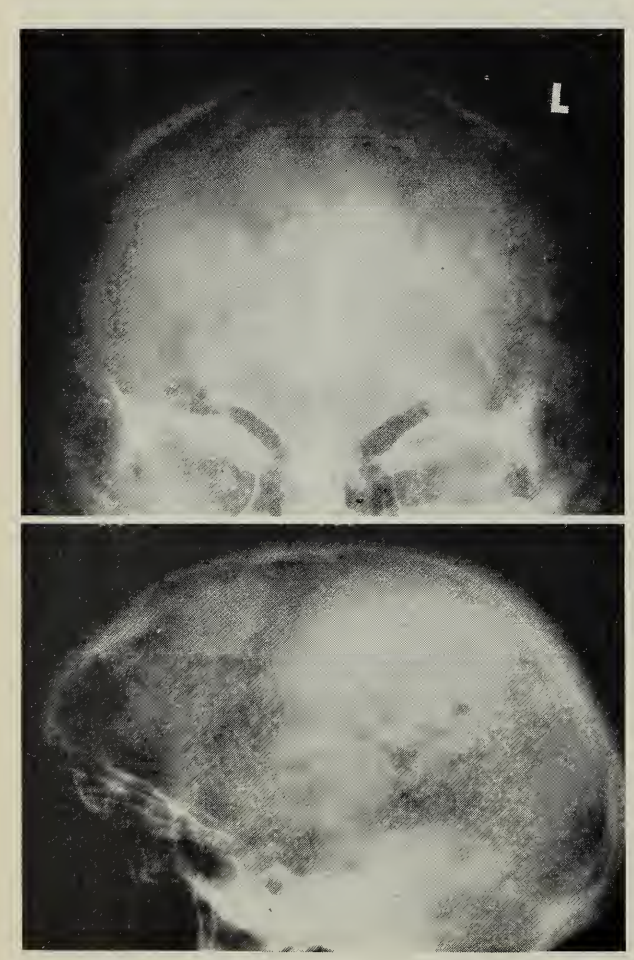


Figure 1.—Antero-posterior and left lateral views showing loculated subarachnoid air in soap-bubble pattern over the left anterior cerebral hemisphere.

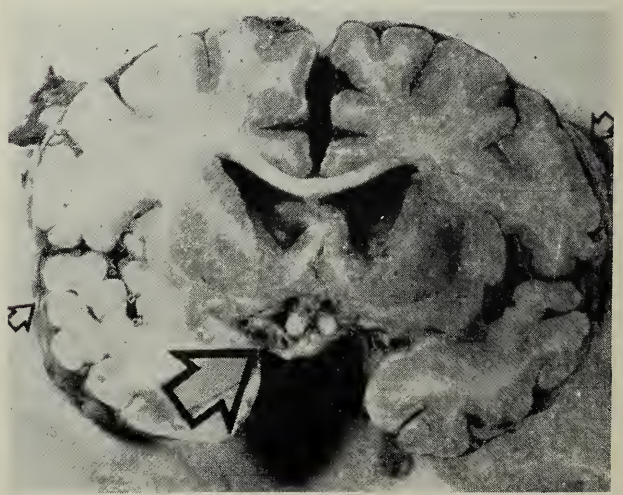


Figure 2.—Coronal section through level of optic nerves. Large arrow points to a large granuloma, small arrows to thickened leptomeninges.

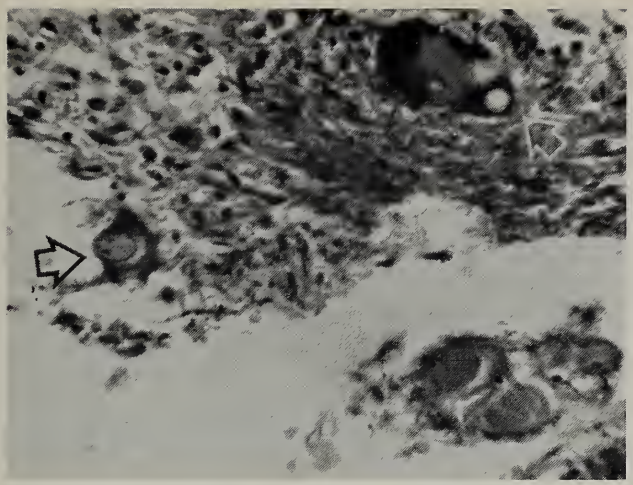


Figure 3.—Section of the large granuloma shown in Figure 2. (×450.) Coccidioides immitis (black arrow) and multinucleated giant cell and engulfed coccidiodes (white arrow).

organisms with endospores. These findings were characteristic of Coccidioides immitis (Figure 3). Focal areas of cortical necrosis were obvious. In many areas the blood vessels were surrounded by pronounced inflammatory reaction, and endothelial proliferation to the point of partial obstruction was observed. One hilar lymph node contained Coccidioides immitis.

Discussion

In this case the striking feature of the pneumoencephalogram was the irregular, asymmetrical and lobulated collection of air in the cerebral subarachnoid space. The soap-bubble appearance was a result of arrested air in areas of cortical atrophy, studded with small leptomeningeal granulomas, adhesions and loculated collections of exudates. It seems justifiable to say that these pneumoencephalographic features are not pathognomonic of coccidioidal meningoencephalitis but of chronic granulomatous process involving the leptomeninges and the surface of the brain. Robertson[1] described similar pneumoencephalographic findings in a case of brucellosis.

Summary

A case of coccidioidal meningoencephalitis has been presented. The pneumoencephalographic appearance was correlated with the pathological findings. The particular pneumoencephalographic pattern observed in this case is characteristic of granulomatous meningoencephalitis.

2530 Atlantic Avenue, Long Beach, California 90806 (Papatheodorou).

REFERENCE

1. Robertson, E. G.: Pneumoencephalography, Charles C Thomas, Springfield, p. 367, 1957.

Acute Uric Acid Nephropathy in Leukemia

H. RICHARD CASDORPH, M.D., PH.D.
Long Beach

A DISCUSSION of abnormalities of uric acid metabolism usually brings to mind, first, the disease gout and its many manifestations. It is not generally appreciated that the most dramatic and extreme abnormalities of uric acid metabolism occur in disorders of the blood-forming organs (leukemia for example) in which the serum content of uric acid may be ten times the normal concentration, or even more. In contrast, the serum concentration in gout does not frequently exceed twice the normal.

Elevations of the serum uric acid may occur in acute and chronic leukemia, lymphoma, polycythemia and myeloid metaplasia.[4] The highest concentrations tend to occur during or following treatment when the number of cells (either in blood or tissues) is decreasing. Treatment with such agents as x-ray, radioactive phosphorus, nitrogen mustard, cortisone and related steroids, 6-mercaptopurine and other agents may be associated with hyperuricemia. Presumably these agents cause increased breakdown of nucleic acids and increased excretion of uric acid. Some may also interfere with the reutilization of catabolites of nucleic acid in the formation of new nucleic acids.[8] The knowledge and recognition of hyperuricemia under these conditions has considerable importance since acute renal failure may follow as a complication and may cause death. This is a potentially preventable complication.

From the Departments of Internal Medicine and Medical Education, St. Mary's Long Beach Hospital, Long Beach.
Submitted June 4, 1964.

In 1958, Kritzler reported three cases in which anuria and uremia complicated the treatment of leukemia, and added seven such cases from the literature. Of the ten patients, only two survived.

The case here reported, in which a patient with leukemia, hyperuricemia and acute renal failure recovered from the complicating conditions, is of special interest inasmuch as the patient had one of the highest serum uric acid concentrations which has been recorded.

Report of a Case

The patient, a 28-year-old white man, was referred to St. Mary's Hospital Clinic service in August 1962 and at that time a diagnosis of subacute myelogenous leukemia was made. Therapy was started with 6-mercaptopurine and prednisone and there was prompt remission of leukemia. The patient was dismissed from the hospital on August 17, taking maintenance doses of the two drugs.

His condition continued satisfactory until the early part of April 1963, when multiple cutaneous infiltrates and nodules appeared in the vertex of the scalp and post-auricular area. On May 4 biopsy specimens taken from lesions on the right side of the neck and on the left forearm were interpreted as showing cutaneous infiltrate of myelogenous leukemia. On May 20 leukocytes numbered 53,800 per cu mm; 55 per cent of them were stem cells. On May 21 the 6-mercaptopurine was increased to 50 mg three times daily and the prednisone dosage was increased to 5 mg four times daily. Serum uric acid on May 22 was 16 mg per 100 ml (normal for men, 2-6 mg).* The patient was told of the importance of maintaining a good urinary output and was advised to drink large quantities of fluids. In the next few days when the uric acid remained elevated, oral doses of sodium bicarbonate two to three times daily were added in an attempt to make the urine alkaline. On May 31 the platelet count was 70,000 per cu mm, blood urea nitrogen (BUN) 26.5 per ml and the uric acid 13.2 mg per 100 ml. Over the following weekend nausea and vomiting developed and the patient was unable to maintain fluid intake. As a result he became moderately dehydrated but did not inform his physician of this fact. On Sunday, June 2, the patient was admitted to the hospital appearing acutely ill and dehydrated. At this time his weight was 170 pounds, which was approximately 10 or 15 pounds less than his usual weight.

Blood pressure was 170/80 mm of mercury, pulse rate 100, oral temperature 102.4°F, and respirations 20 per minute. The infiltrates of the scalp and cervical region had regressed somewhat as compared with two weeks earlier. On examination of the optic fundi no hemorrhages or exudates were seen. In the mouth there were several bleeding areas from petechia of the gums, buccal mucosa and pharynx. The previously described infiltrates on the neck were noted. No abnormalities were observed in the heart or lungs. The liver extended to three finger breadths below the right costal margin and the spleen was enlarged to the umbilicus. There was acute tenderness in the left posterior flank and mild tenderness in the right posterior flank. Examination of the prostate and rectum were negative except for rectal tenderness. There were purpuric spots over the shoulders and upper extremities predominantly and a few purpuric areas on the left anterior thigh. The impression at this time was that the patient was entering the acute blastic phase of leukemia and was having bleeding complications as manifested by bleeding from the mouth and intestinal tract.

On the morning following admission the uric acid and blood urea nitrogen had both become more elevated while at the same time the number of leukocytes was 28,000 per cu mm, with 78 per cent stem cells. During the first eight hours in hospital the urinary output was only 150 ml. The clinical appearance of the patient was typical of extra-cellular fluid volume deficiency. Fluids were administered intravenously and the output of urine gradually rose. On June 4, 1963 an intravenous pyelogram was attempted but the opaque medium could not be visualized. In spite of an adequate urinary volume (1 to 2 liters per day) the blood urea nitrogen and uric acid continued to rise. On June 7 the uric acid reached 66.0 mg per 100 ml and even though this subsequently began to fall the blood urea nitrogen continued to rise until June 10, when it reached a peak value of 185 mg per 100 ml. The serum creatinine at that time was 9.7 mg per 100 ml. At this time the patient appeared toxic from azotemia and for the first time had clinical symptoms typical of the uremic syndrome, with diffused twitchings of various parts of his body.

Subsequently both the blood urea nitrogen and uric acid fell as the diuretic phase of renal injury began, and by the end of the month renal function was essentially normal.

The 6-mercaptopurine therapy was discontinued June 10, and subsequently there was remission of the leukemic process. The patient was dismissed from the hospital on June 28, taking only prednisone, 25 mg per day in divided doses and small doses of sodium bicarbonate in an attempt to alkalinize the urine.

The following month the leukemia process resumed. A leukocyte alkaline phosphatase determination on July 8 showed pronounced elevation of this

*Phosphotungstate method using silicate[1].

enzyme consistent with acute blastic leukemia. At this time the leukocyte count was rapidly rising and blast cells again were present in the peripheral blood. The patient died July 30, 1963, of bleeding complications and bacteremia due to *Pseudomonas aeruginosa*. On July 27 the serum uric acid was 12.6 mg per 100 ml and on the day before death the BUN was 15 mg per 100 ml. At autopsy moderate infiltration of the kidneys with leukemic cells was noted.

Discussion

In one of the patients with this syndrome reported by Kritzler,[7] dehydration due to hot weather appeared to be the precipitating factor. Diuresis and recovery followed ureteronephrostomy and removal of urate precipitate on one side.

Firmat and coworkers[5] in 1960 reported the case of a six-year-old white boy with a two-month history of lymphosarcoma diagnosed at laparotomy. Postoperatively the patient was treated with radioactive cobalt to an abdominal port. Subsequently in evaluation at the Memorial Center for Cancer and Allied Diseases, results of examination of bone marrow aspirate were consistent with acute leukemia. At the time of admission, the child was severely dehydrated and oliguric with a mild elevation of the blood urea nitrogen value and severe thrombocytopenia. On the following day 5 mg of methylprednisolone was given and 24 hours later the serum uric acid had risen to 80.5 mg per 100 ml and the blood urea nitrogen was 112 mg per 100 ml. Subsequently dialysis with the artificial kidney was carried out and large doses of methylprednisolone were given and the uric acid decreased to 29.1 mg per 100 ml. The patient died 45 days later of acute leukemia. At autopsy lymphosarcoma was present in all lymph nodes and there were lymphosarcoma infiltrates in the stomach and small bowel mucosa. Both kidneys were normal in size and morphologically. No uric acid crystals were found.

Uric acid is an end product of the oxidation of purines in the body. It may be obtained from the breakdown of cellular nucleoprotein and also from the metabolism of dietary nucleoprotein. Uric acid is only slightly soluble in water, but forms soluble salts with alkali. For this reason it precipitates from an acid urine on standing. Since the distal nephron is the site of acidification and concentration of urine, one might surmise that this should be the site of precipitation of uric acid crystals when concentration exceeds a critical level. Barry and coworkers[2] reported that this is where uric acid precipitation may occur when low pH and reabsorption of water from the fluid exceeds critical levels. They expressed belief that precipitation of urates within the distal nephron obstructs urine flow and increases hydrostatic pressure above the obstruction sufficient to block glomerular filtration. (Extra renal urate precipitation may also occur in the ureter or renal pelvis, bringing about obstruction to urine flow). If the process continues to involve enough nephrons, acute hyperuricemic renal failure may develop. They also said that "at the normal blood pH, uric acid is dissociated so that the ratio of salt to acid is 99:1 and total solubility of salt plus acid approximates 150 mg per 100 ml," and that "at a urinary pH of 5, the salt to acid ratio is 1:5 with a total solubility of only 8 mg per 100 ml."

Duncan and coworkers[3] induced hyperuricemia in dogs and rats by the intravenous administration of uric acid. The most striking and definitive changes in the kidneys of these animals were seen in rats that had been given large doses of uric acid intravenously over a period of several days. Plugging of collecting tubules and distal convoluted tubules by urate was demonstrated in all these animals. Proximal to urate casts were tubular dilatation and, in some areas, compression of epithelial cells with vacuolization, desquamation and necrosis.

Uric Acid Excretion

That uric acid excretion is increased in many patients with leukemia was shown in a study by Sandberg and coworkers.[8] They studied the urinary excretion of uric acid in 17 normal subjects and 38 patients with leukemia. The mean excretion of uric acid by the normal subjects was 6.5 mg per kg of body weight in 24 hours. The mean excretion of uric acid in 14 patients with acute lymphoblastic leukemia was 30.3 mg per kg per 24 hours. In 13 patients with acute myeloblastic leukemia the amount was 13.0 mg; in six patients with chronic lymphocytic leukemia, 5.2 mg; and in five patients with chronic myelocytic leukemia, 13.5 mg. Following therapy with cortisone, 6-mercaptopurine or amethopterin, the urinary excretion of uric acid increased in the cases of acute leukemia as the leukocyte count declined. However, in association with administration of an aromatic nitrogen mustard derivative to one patient with chronic lymphocytic leukemia and busulfan (Myleran®) to one patient with chronic myelocytic leukemia, there was only a slight increase in uric acid excretion.

Prophylaxis and Therapy

It is to be hoped that with greater general knowledge of this entity, it can be prevented. The serum uric acid concentration should be checked at appropriate intervals in patients in whom hyperuricemia is likely to develop. Dehydration is to be avoided and an adequate urine volume should be maintained. Forcing fluids to maintain diuresis may

sometimes be indicated. It appears that adequate hydration with a high urine output during treatment is the simplest and most basic preventive measure; of course, in the presence of renal function impairment, fluid balance and therapy must be carried out with appropriate caution.

Although some investigators have cautioned about the possible hazards of alkali therapy,[7] others[2,6] have expressed the opinion that in the presence of hyperuricemia the administration of alkali such as sodium bicarbonate is indicated to raise the urine pH toward the alkaline side, thus increasing urate solubility.

Barry and coworkers reported the use of an intravenous infusion of an osmotic diuretic, Mannitol®, and peritoneal dialysis in some cases of acute uric acid nephropathy[2] unresponsive to the above measures. Hemodialysis has also been used.[5]

It should be emphasized that extrarenal obstruction has been reported to occur secondary to plugging of the ureters and renal pelvis with uric acid crystals, and ureteral catheterization and irrigation has been reported beneficial in some cases. If this fails nephrostomy may be performed.[7]

Kritzler reported the case of a 66-year-old woman with a diagnosis of chronic myeloid leukemia in whom anuria and uremia developed after treatment with radioactive phosphorus. Subsequently urologic evaluation revealed blockage of both ureters. Left nephrostomy and pyelostomy were performed. The ureter and pelvis were described as full and gritty. Diuresis followed pyelostomy.[7]

It may be that therapy of these conditions should be moderated so as to avoid a sudden marked decrease in the cell population (e.g. marked fall in the white blood count in leukemia).

Summary

The most extreme abnormalities of uric acid metabolism occur in hematologic abnormalities such as leukemia. Increased excretion of uric acid frequently occurs and this tends to be increased further by treatment such as when the leukocyte content of peripheral blood is decreasing. Pronounced hyperuricemia may occur at this time and acute renal failure may result as a complication. Uric acid crystals may be precipitated out of the urine in the distal tubules and collecting tubules or in the ureters or renal pelves, and this may result in obstruction of urine flow and acute renal failure. This syndrome has been called acute uric acid nephropathy.

In a case here reported, a patient being treated for acute myeloblastic leukemia developed pronounced hyperuricemia and renal insufficiency following an episode of vomiting and dehydration. During the patient's recovery from this acute illness there was a diuretic phase in which up to eight liters of urine was excreted per 24 hour period.

Acute uric acid nephropathy is a potentially preventable complication. Thus the importance of monitoring the serum level of uric acid, maintaining adequate hydration and a good urine output is apparent. Some investigators have advised the administration of alkali in order to increase the urine solubility of urates. Mannitol® has been used as an osmotic diuretic in certain circumstances.

St. Mary's Long Beach Hospital, 509 East Tenth Street, Long Beach, California 90813.

REFERENCES

1. Archibald, R. M.: Colorimetric measurement of uric acid, Clinical Chemistry, 3:102-105, 1957.

2. Barry, K. G., Hunter, R. H., Davis, T. E., and Crosby, W. H.: Acute uric acid nephropathy, Arch. Int. Med., 111: 110-117, April, 1963.

3. Duncan, H., Wakim, K. G., and Ward, L. E.: Hyperuricemia in animals, Proc. Staff Meet. Mayo Clinic, 38:411-421, Sept. 11, 1963.

4. Duncan, H., Elliot, W., Hall, M., Kerr, D. N. S., and Wort, A. J.: Acute renal failure complicating a reticulosis—Remission following haemodialysis, Brit. Med. J., 5338: 1130-1132, April 27, 1963.

5. Firmat, J., Vanamee, P., Klauber, L., Krakoff, I., and Randall, H. T.: The artificial kidney in the treatment of renal failure and hyperuricemia in patients with lymphoma and leukemia, Cancer, 13:276-282, 1960.

6. Gold, G. L., and Fritz, R. D.: Hyperuricemia associated with the treatment of acute leukemia, Ann. Int. Med., 47: 428-434, Sept., 1957.

7. Kritzler, R. A.: Anuria complicating the treatment of leukemia, Am. J. Med., 25:532-538, 1958.

8. Sandberg, A. A., Cartwright, G. E., and Wintrobe, M. M.: Studies on leukemia: I: Uric acid excretion, Blood, 11:154-166, 1956.



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California Medicine

EDITORIAL

A Successful Conference on Continuing Medical Education

AT TWO HIGHLY successful conferences last month good progress was made in the development of a sound plan that will make the very best use of the many courses and other methods for the continuing medical education of physicians in practice that heretofore have been offered piecemeal by the California Medical Association, medical schools, organizations of medical specialists, voluntary health agencies, hospital staffs, the pharmaceutical industry and others.

Both conferences (held in Los Angeles November 14 and in San Francisco November 15) were sponsored by the CMA's Scientific Board and its Committee on Continuing Medical Education. They were "top-drawer" affairs and each attracted nearly a hundred outstanding men and women from leading medical schools, hospitals, voluntary health agencies, county medical societies, public health departments and specialty societies.

The long-range goal of the planning that was discussed is the general betterment of medical practice in California through continuing education of practicing physicians.

One of the targets is efficient coordination of the multitudinous and sometimes conflicting array of postgraduate medical courses offered throughout the state.

Out of the comprehensive day-long discussions, two important areas of agreement emerged:

1. There is a definite need to establish an information center to which anyone planning to offer a course for postgraduate education can turn for information on meetings that have already been scheduled by others. There they could find out the subjects to be covered, by whom offered, the names of instructors, the dates and the geographic location.

With a central source of information of this kind available, organizations planning courses could easily avoid a conflict of dates, the overstressing of one subject, the overburdening of faculty members called on for teaching assignments and the scheduling of a plethora of courses in some areas while permitting a drought in others.

2. To meet the need for continued and improved coordination in the future, some mechanism must be developed which can be employed in close conjunction with the Committee on Continuing Medical Education.

The structure for coordination probably can be best worked out by all organizations interested in this field through the Committee on Continuing Medical Education. It is anticipated that studies to this end will be made by the committee and recommendations forwarded to the Council.

The conferences were a logical result of one of the major activities of the committee and the Scientific Board. [Elsewhere in this issue, CMA President James C. Doyle discusses the Board's many other activities.] Back in 1959 and 1960, a survey conducted by the CMA's ad hoc Committee on Continuing Education and Scientific Activities led to the conclusion that there probably was an overabundance of postgraduate programs and some duplication of effort. More recent information indicates that the problem has become intensified.

Among those who traveled long distances last month to attend the conferences and tackle the problems were Hugh H. Hussey, M.D., director of the Division of Scientific Activities, American Medical Association and Theodore G. Klumpp, M.D., New York, member of the Board of Directors, Pharmaceutical Manufacturers Association.

Dr. Hussey outlined the AMA's numerous activities in continuing education, then added a note of

caution: "Whatever the form of continuing education in the future, much is to be gained by coordination of existing programs, providing that the coordination process does not preempt the educational process."

Dr. Klumpp emphasized the need for coordination by pointing out that "we are living in a period in which the pace of scientific and technical change is swifter than ever before. Medical progress has been in the forefront of this rapid advance."

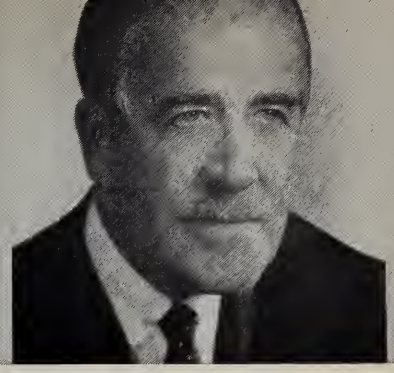
"The invention and availability of new medicines," he said, "has been so prolific that therapeutics learned in medical school is soon outdated. For example, 70 per cent of today's prescriptions could not have been written ten years ago because the drugs did not exist."

Space does not permit mentioning the many other professional men and women who contributed so much to the success of the conferences. But certainly George C. Griffith, M.D., deserves special praise for so effectively serving as moderator for both conferences and as long-time chairman of the CMA Committee on Continuing Medical Education.

We are confident that when recommendations of the conferences are adopted and put into practice, they will prove to be a powerful and effective means to the desired end: the best possible postgraduate educational opportunities for California's physicians.



The President's Page



Your Scientific Board—
A Beacon to Better Medicine

The Scientific Board of the California Medical Association is approaching the end of its second year as a functioning body. Perhaps now is a good time to evaluate its activities to date—and to take a look at its future.

First, it may help to recall the Board's past and its reason for being. It was organized early in 1963 on recommendation of the CMA's ad hoc Committee on Continuing Education and Scientific Activities, headed by Dwight L. Wilbur. The committee, appointed by the CMA Council, had made a three-year study of the need for such a board because many CMA leaders were deeply concerned over evidence of lessening interest in the CMA as an educational and scientific organization.

They felt that there was a lack of coordination and too much fragmentation in these functions. The study confirmed this. The Wilbur Committee requested that a scientific board be formed to coordinate them and bring them into harmony with related activities carried on by other organizations of recognized stature.

With approval of the CMA Council and House of Delegates, the Scientific Board was set up to tie together the divergent elements in the fields of medical education and science and to improve their operations. Specifically, the 39-member Board, directed by Edward B. Shaw, has these responsibilities:

It directs all CMA continuing medical education programs; coordinates its medical, scientific and educational activities with those of medical schools, other societies and organizations; plans and implements all CMA general scientific meetings, including the Annual Session; is the source for obtaining and communicating scientific information to CMA members, the Council, the House of Delegates, commissions and committees of the association and the public, and advises the editor and editorial board of California Medicine.

How well has the Board been doing? The answer is supplied by current activities of some of the Board's major committees. For example:

The Committee on Scientific Assemblies has constantly improved coordination of scientific meetings, as well as their quality. "Virology" will be the theme of the next Annual Session, scheduled for March 28 to 31, 1965, in the Mark Hopkins and Fairmont hotels, San Francisco. In addition, many other programs on a variety of subjects will be presented—nearly 35 per cent more than ever before.

The Committee on Scientific Information has sponsored authoritative articles and special reports, some yet to be published, on such vital subjects as botulism, cholesterol, stress and heart diseases, influenza vaccine, measles vaccine, whiplash injuries, venereal diseases and their control, meningitis, multiple drug usage and its dangers and the abuse of percodan. A new Committee on Adverse Drug Reactions currently is making a study of the possible association of aplastic anemia and the use of chloramphenicol. Findings will be reported to the State Legislature and to practicing physicians.

The influence of the Committee on California Medicine is visible in improvements wrought in our official journal. A new cover and newly designed inside dress have been well received by readers, and steady progress is being made in a program to improve the quality of content. Recently the American Medical Writers' Association named California Medicine the outstanding state medical journal of 1964, noting in the citation that it "reflects the progressive attitude of the medical profession in a great forward moving state."

A booklet evaluating unproved methods of treating cancer (krebiozen, the Hoxsey method, etc.) has been brought up to date by the Committee on Cancer and is available to all CMA members from the Association's headquarters in San Francisco.

An ad hoc Committee on Libraries has started a full-scale study to improve medical libraries and augment their financial support.

Working with the State Department of Public Health, the Committee on Maternal and Child Care has initiated studies of 917 maternal deaths in California and is investigating 321 cases of deaths from hemolytic diseases in the newborn. These studies may help to decrease such deaths in the future.

Last month the Committee on Continuing Medical Education held two highly-successful conferences to develop ideas for coordinating the numerous and sometimes conflicting postgraduate courses for physicians. The committee hopes to eliminate these conflicts so that in the future you won't have to pass up one good course to attend another.

These are just some of your Scientific Board's activities. All have one basic goal: "To promote the science and art of medicine, the protection of the public health and the betterment of the medical profession."

The Board is making excellent progress toward this goal. And you can help. I urge you to maintain an active interest in what the Board is doing, and, especially, to attend the Annual Session next March. We all stand to benefit.

James C. Doyle



California Medical Association

NOTICES AND REPORTS

Council Meeting Minutes

Tentative Draft: Minutes of the 505th Meeting of the Council, San Francisco, Thunderbird Hotel, October 31, 1964.

The meeting was called to order by Chairman Anderson at the Thunderbird Hotel, San Francisco International Airport, on Saturday, October 31, 1964, at the hour of 10:00 a.m.

Roll Call

Present were President Doyle, President-Elect Teall, Speaker Quinn, Vice-Speaker Telford, Secretary Hosmer and Councilors MacLaggan, Wilson, Todd, Taw, Gooel, Bullock, Ham, Rogers, Maguire, Murray, Richard S. Wilbur, Miller, Watts, Fenlon, Kay, Anderson, Dozier and Cosentino and ex-officio Councilor Sherman.

Absent for cause, Editor Dwight L. Wilbur, Councilors O'Connor, Kaiser, Grunigen and Shaw.

A quorum present and acting.

Present by invitation were Messrs. Hunton, Thomas, Clancy, Collins, Whelan, Klutch, Clark, Edwards, James, Eberlein, Blackley, Goldman and Moreillon, Doctor Miller and Mmes. Griffith and Redfern of the CMA staff; Messrs. Hassard and Huber, legal counsel; Messrs. Read, Salisbury, Putnam and Brown of the Public Health League; county executives Scheuber of Alameda-Contra Costa, Rideout of Butte-Glenn, Geisert of Kern, Lingerfelt of Fresno, Rosenthal of Los Angeles, Blankfort of Marin, Colvin of Monterey, Bannister of Orange, Walters of Riverside, Donmyer of San Bernardino, Nute of San Diego, Neick of San Francisco, Thompson and Monnich of San Joaquin, Wood of San Mateo, Marvin of Santa Barbara, and Brown of Sonoma; Doctors Malcolm Merrill of the State Department of Public Health, Robert Hewitt of the State Department of Mental Hygiene and Lester McDonald of the State Department of Social Welfare; Doctors T. Eric Reynolds and Paul Hoagland and Messrs. Paolini, Nyron, O'Dea, Heller and Potloff of California Physicians' Service; Messrs. Clifton Linville and Mark Berke of the California Hospital Association; Mr. John Pompelli of the American Medical Association; Mr. Robert Garrick, consultant; Doctors Warren L. Bostick, John Schaupp, Edgar Wayburn and others.

1. *Minutes for Approval*

On motion duly made and seconded, minutes of the 504th Council meeting, held September 19, 1964, were approved.

2. *Membership*

(a) A report of membership as of October 28, 1964, was presented and ordered filed.

(b) On motion duly made and seconded in each instance, 24 applicants were elected to Associate Membership. These were: Fred D. Fisher, Alexander N. Gansa, Elizabeth Ann Jolly, George L. Ponomareff, Alameda-Contra Costa; Geraldine B. Branch, Jack Brook, Robert C. Heaven, Arthur David Schwabe, Robert Lincoln Smith, James Charles Thompson, Los Angeles County; Sheldon Wayne Grinnell, Robert Lee Julian, Napa County; Maria Barrows, John M. Coble, Wallace Epstein, Deanne F. Gottfried, Sol Hazen, Verne T. Inman, Steven Ross, San Francisco County; Victor Hugh Vogel, Santa Cruz County; Henry E. Stafford, Sonoma County; Norbert I. Rieger, Ventura County; Frank Wilson Price, Yolo County; Rae C. Lindsay, Yuba-Sutter-Colusa Counties.

(c) On motion duly made and seconded in each instance, eight members were elected as Retired Members. These were: Isaac Alexander, Charles C. Boericke, Frank R. Johnston, Wm. A. S. Magrath, Alameda-Contra Costa County; James W. Crever, Lassen-Plumas-Modoc-Sierra County; Frank A. M.

JAMES C. DOYLE, M.D. President
RALPH C. TEALL, M.D. President-Elect
WILLIAM F. QUINN, M.D. Speaker
JOSEPH W. TELFORD, M.D. Vice-Speaker
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Bryant, Mac Louis Sherwood, Los Angeles County; Ethel L. Righetti, San Francisco County.

(d) On motion duly made and seconded, 16 members were voted a reduction of dues because of postgraduate study or prolonged illness.

3. *1964 House of Delegates Resolutions*

Report was presented on status of resolutions from the 1964 House of Delegates. Resolution 66-64 was discussed and the entire report was ordered rewritten and elaborated for presentation at the December meeting, at which time approval will be sought to forward the report to members of the 1965 House of Delegates. The report to be sent to delegates will also contain the "resolved" portion of each resolution.

4. *Finance Committee*

Doctor Murray, chairman, reported that the Finance Committee had held a preliminary meeting and that another meeting would be held prior to the December Council meeting. A proposed budget will be presented to the Council in January and following Council approval the budget will be given to the members of the appropriate reference committee of the House of Delegates for their information prior to the 1965 Annual Session.

5. *Committee on Committees*

President-Elect Teall, as chairman, presented nominations for appointments approved by the Committee on Committees. All were approved, as follows:

Medical Staff Survey Committee—Rush Blodget, Redding, vice Charles D. Miller, resigned. J. Ralph Hughes, State Department of Public Health, vice Glennard E. Lahrson, resigned.

Maternal and Child Care—District II committee —Bruce Rolf, Los Angeles, vice William Benbow Thompson, Robert F. Kelly, vice Keith P. Russell.

Committee on Review of Radiation Hazards Program—Charles E. Grayson, Sacramento, chairman; Justin Williams, Robert Scanlon, Reginald Smart, Walter Brignoli, Hal B. Stewart, Jr., members; Mr. Robert Pugh, Pasadena, Consultant.

Committee to Cooperate with California Hospital Association on Regional Hospital Planning Committees—Glenn Pope, chairman; John W. Gates, Joseph Telford, Pierre Salmon, Richard Taw, Jean Crum, Paul Doehring, Laurence Mosier and James Dalton, members; John F. Murray, Edward H. Crane, Jr., Robert F. Schell, consultants. It was agreed that these appointments would be for the interim period preceding the 1965 Annual Session.

6. *Bureau of Research and Planning*

Doctor Sherman reported on several activities of the bureau, including the following:

(a) A survey of the need of physicians in California, in response to Resolution 4-64 of the 1964 House of Delegates. Study has been completed and copies distributed.

ACTION: Report approved and publication authorized.

(b) Study among psychiatrists on professional courtesy. The study suggested that its findings should be applied to all physicians, regardless of specialty, and that collection of professional fees should be a permissive matter where long-term care was involved and where there was advance agreement between the parties.

ACTION: Report received for submission to House of Delegates, with stress on permissive feature of findings.

(c) Study under Department of Mental Hygiene grant on manpower needs for mental health. Copies will be distributed to members of Council.

(d) Studies under way on reasons for nonmembership of physicians in Los Angeles County and on the quality of medical care.

Doctor Sherman further reported that six surveys are planned for the coming year.

7. *Committee on Legislation*

Doctor Dan O. Kilroy, committee chairman, reported that letters have been sent to all chiropractors in the state, urging the contribution of $40 each toward a fund of $18,000 proposed for the retention of a qualified lobbyist. This effort, if successful, will mean a repetition of earlier attempts to secure legislation broadening the scope of practice of this group.

Doctor Kilroy also reported on the proposed opening of an office in Sacramento, as a joint effort with the Public Health League, to serve as a year-around headquarters for keeping in touch with state offices and interim legislative committees.

Mr. Ben Read outlined the activities of legislative representatives in following interim committee hearings in recent weeks.

8. *Department of Public Health*

Doctor Malcolm Merrill, State Director of Public Health, reported that a decision had been reached to close Fort Ord against all new recruits for a 30-day period in an effort to combat the spread of meningococcic meningitis. This recess period, he said, would not eliminate the disease and further cases may be expected following this shutdown. Doctor Merrill answered various questions from Councilors and agreed to accept any assistance the Association might give.

ACTION: Voted to authorize the chairman of the Scientific Board, together with consultants of his

own choosing, to contact the Department of Public Health and others to determine if the Association can be of help in resisting the meningitis danger at Fort Ord.

Doctor Merrill also reported on the hearings held on krebiozen by the Cancer Council and stated that some difficulty may be experienced in the Legislature in the effort to extend the life of the law permitting control over the use of drugs in the treatment of cancer.

9. *Department of Rehabilitation*

Doctor Richard Young, medical director of the State Department of Rehabilitation, reported on the status of the department's program.

10. *California Hospital Association*

Mr. Clifton Linville, immediate past president of the California Hospital Association, introduced Mr. Mark Berke, president-elect of the association, who commented favorably on the newsletter to be jointly prepared by the two associations for distribution to hospital administrators and hospital medical staff personnel.

ACTION: Voted to approve a resolution presented by President Doyle in praise of the California Hospital Association on its leadership and expressing the hope that the cooperative attitude of the two associations might continue.

ACTION: Voted to adjourn this meeting out of respect for Clifton H. Linville, immediate past president of the California Hospital Association.

11. *Medical Executives Conference*

Mr. Everett Bannister, chairman, reported on the subjects covered in a conference meeting held October 30. He also presented Messrs. Robert Marvin of Santa Barbara County, Mike Monnich of San Joaquin, Bill Burris of San Diego, H. Martin Baker of Los Angeles, Robert Blough of Orange and Howard Pearce of Santa Clara as nominees for election as members of the conference.

ACTION: Nominees elected as members of the Medical Executives Conference as presented.

12. *Report of the President*

President Doyle reported on his appearances before various groups, including the California Hospital Association and the Woman's Auxiliary to CMA, since the last Council meeting.

13. *California Medical Education and Research Foundation*

Doctor Doyle, president, requested that authority be given to CMERF to plan a series of conferences with labor leaders, educators, full-time salaried physicians and others in a continuation of studies on the role of medicine in society.

ACTION: Authority voted as requested.

14. *Conference of Component Society Officers*

Doctor Edgar Wayburn, chairman of the committee on program of the 1965 conference of component society officers, presented the proposed program for the January 16 conference, to be held at the Statler Hilton Hotel, Los Angeles.

ACTION: Program approved.

15. *Report of President-Elect*

President-Elect Teall reported on his activities in recent weeks, including a meeting October 30 with the Finance Committee and the chairmen of the several commissions.

16. *Medical Staff Survey Committee*

Doctor MacLaggan reported that two inspections were scheduled for the near future, one in San Joaquin County and one in a group of hospitals in one area of Los Angeles County.

Doctor MacLaggan also reported that he had been invited to participate in a hospital conference scheduled as a part of the American Medical Association meeting in Miami Beach and asked authority to attend.

ACTION: Trip to Miami Beach for hospital conference authorized.

17. *State Employees Retirement System*

President-Elect Teall called attention to the report of Medical and Hospital Advisory Council to the Board of Administration of the State Employees Retirement System. This council was under the chairmanship of Doctor Malcolm S. M. Watts and included Doctor Dave F. Dozier in its membership. Doctor Teall recommended the report for thorough study by all Councilors.

ACTION: Motion passed commending the Advisory Council and Doctors Watts and Dozier on an outstanding piece of work.

18. *Legal Department*

Mr. Hassard outlined the need for reapportionment of the State Senate under a series of U.S. Supreme Court decisions and stressed the changes such reapportionment would create in state legislative circles.

19. *Ad Hoc Committee on Radiology*

The chairman read a letter from the California Radiological Society to Doctor Burt Davis, chairman of the ad hoc committee, in which the radiological group expressed willingness to cooperate in a review of outpatient radiography, electrocardiograms and electroencephalograms in two counties.

20. *Ad Hoc Committee on Medical Discipline*

Doctor Anderson reviewed the testimony he had given before a State Senate committee on medical discipline and reported that additional time had been allowed for a study on the recommendations made for cases involving mental illness.

21. *Ad Hoc Committee on Workmen's Compensation*

Doctor Anderson reported that the Governor's "Blue Ribbon Committee" on Workmen's Compensation was still working on its report. Meanwhile, the chairman of the Industrial Accident Commission has appointed a Medical Advisory Committee which includes Doctor Paul McMaster, Doctor Francis J. Cox and Mr. William Whelan in its membership, which is studying a system of selection of impartial medical advisors to the commission.

22. *Commission on Medical Services*

Chairman Murray reported that the Committee on Federal Medical Care had held two meetings on the Department of Defense program for medical care of military dependents and was hopeful that an improved schedule of fees might be developed.

Doctor Murray and Doctor Pierre Salmon presented the proposed bylaws of the California Joint Council for Health Care of the Aged and requested approval from the Association as a sponsor of the Council.

ACTION: Bylaws accepted with minor modification.

Doctors Murray and Salmon also presented a paper discussing the definitions of several medical care terms, including "convalescent" and "long-term care" prepared to assist the State Department of Public Health in the classification of hospitals under state licensure.

ACTION: Statement approved in principle, subject to clarification in its language. Approval to be given by Commission on Medical Services prior to submission to State Department of Public Health.

23. *Time and Place of Next Meeting*

It was agreed that the next Council meeting, to be held December 12, 1964, should be held in San Francisco. (Note: Because suitable meeting rooms are not available in San Francisco, the meeting will be held in Los Angeles as originally scheduled.)

24. *Commission on Community Health Services*

Doctor Kay, chairman, presented several items in behalf of committees within the commission, including:

(a) For the Committee on School Health a set of guides for a teacher health program in the local school district was presented, with a request for approval.

ACTION: Guides approved as submitted.

(b) For the Committee on Disaster Medical Care, the proposal was presented that the Association go on record as approving the transfer of the medical care aspects of disaster preparedness from the State Disaster Office to the State Department of Public Health and that proper provision be made in budgeted funds for maintenance of an adequate staff to make the medical aspects of the program effective.

ACTION: Voted to defer action to the December meeting, pending conferences with the California Hospital Association and with the large regional disaster committees in the state.

(c) A proposed program of demonstrations in rural areas on rehabilitation services, to be performed by Stanford University School of Medicine under grant funds, was presented with a request for approval in principle. Program would aim at educating medical and paramedical personnel in the provision of rehabilitation services at the home town scene.

ACTION: Proposed program approved in principle.

(d) For the Committee on Military Affairs, a resolution was presented, asking that the Department of Defense be urged to establish for its retired personnel a system of prepaid health insurance similar to the existing program for federal employees, rather than embark on a program of building military and veterans' hospitals to handle the anticipated peak load in the next decade.

ACTION: Proposed resolution approved for offering to California delegation to the American Medical Association.

25. *Commission on Professional Welfare*

(a) Sponsorship of a disability insurance program carried by several hundred members of the Forty First Medical Society was requested, so that the participating members might continue the insurance coverage at favorable rates.

ACTION: Voted to sponsor insurance program offered by Washington National Life Insurance Co. to members of the Forty First Medical Society.

(b) The commission offered a statement on the staffing of hospital medical emergency units and requested approval for distribution.

ACTION: Statement approved for distribution.

Adjournment

There being no further business to come before it, the meeting was adjourned at 4:30 p.m. in honor of Mr. Clifton H. Linville.

CARL E. ANDERSON, M.D., *Chairman*
MATTHEW N. HOSMER, M.D., *Secretary*

1964 CONSTITUTIONAL AMENDMENTS FOR ACTION IN 1965

Three amendments to the Constitution were introduced at the final meeting of the 1964 House of Delegates. These are required to lie upon the table until the next regular meeting of the House of Delegates; meanwhile, they must be published in at least two issues of CALIFORNIA MEDICINE. They will be considered by the appropriate reference committee of the House of Delegates and then will be reported to the members of the House in the 1965 Session.

CONSTITUTIONAL AMENDMENT NO. 1-64

Subject: Composition of Council—Article III, Part B, Section 9(b)

Introduced by: Carl E. Anderson

Representing: The Council

Resolved: That Article III, Part B, Section 9, paragraph (b) be amended by adding the words shown in italics so that the paragraph shall read as follows:

(b) The president, president-elect, *immediate past president,* speaker and vice-speaker.

' ' '

CONSTITUTIONAL AMENDMENT NO. 2-64

Subject: Composition of Council—Article III, Part B, Section 9(a)

Introduced by: Chester Herrod, M.D.

Representing: San Francisco

WHEREAS, the present size of the Council is consistent with efficiency, and

WHEREAS, an increase in size may diminish the efficiency of the Council, and

WHEREAS, the number of doctors in California will inevitably increase and thereby increase the size of the Council, and

WHEREAS, a change in the numerical basis for councilor selection is the simplest method of retaining the present size of the Council; now, therefore be it

Resolved: That Article III, Part B, Section 9(a), be amended to read: (New language in italics)

"Each councilor *or subcouncilor* district, as specified in this Constitution, shall be entitled to one councilor for each *sixteen hundred (1600)* active members, or *minor* fraction thereof, according to its membership as of the first day of September of the preceding year; provided that each councilor *or subcouncilor* district shall be entiled to a minimum of one councilor."

' ' '

CONSTITUTIONAL AMENDMENT NO. 3-64

Subject: Councilor Districts—Article III, Part B, Section 10

Introduced by: Chester Herrod, M.D.

Representing: San Francisco

WHEREAS, the increasing number of doctors in some counties in California has altered the equilibrium which previously existed in councilor districts, and

WHEREAS, since crowded highways makes attendance from a distance at councilor district caucuses increasingly difficult, and

WHEREAS, the need to redefine councilor districts to recognize population changes and for convenience of delegates is apparent; now, therefore be it

Resolved: That Article III, Part B, Section 10, of the Constitution be amended to read as follows: (New language in italics)

"There are *fourteen (14)* districts as follows:

"District Number One, comprising San Diego County.

"District Number Two, comprising *Orange County.*

"District Number Three, comprising the County of Los Angeles.

"District Number Four, comprising *Imperial, Riverside, San Bernardino, Inyo and Mono Counties.*

"District Number Five, comprising *Ventura and Santa Barbara Counties.*

"District Number Six, comprising *Kern, Kings, Tulare, Fresno, Madera, Merced, Stanislaus, Mariposa, Calaveras, Tuolumne and San Joaquin Counties.*

"District Number Seven, comprising *San Luis Obispo, San Benito, Monterey and Santa Cruz counties.*

"District Number Eight, comprising *Santa Clara and San Mateo counties.*

"District Number Nine, comprising *the County of San Francisco.*

"District Number Ten, comprising *Alameda and Contra Costa Counties.*

"District Number Eleven, comprising *Marin, Solano, Napa, Sonoma, Lake, Mendocino, Humboldt and Del Norte counties.*

"District Number Twelve, comprising *the County of Sacramento.*

"District Number Thirteen, comprising *Amador, Alpine, El Dorado, Placer, Nevada, Sierra, Yuba, Colusa, Sutter, Yolo, Glenn, Butte, Tehama, Trinity, Shasta, Lassen, Plumas, Modoc and Siskiyou counties.*

"District *Number Fourteen,* consisting of any society which is not limited as to geographical area, or the area of which overlaps the area covered by any one or more existing component societies; such society and its members shall not be considered to be members of any other councilor district."

The Committee on Scientific Assemblies of the

SCIENTIFIC BOARD

presents the

1965

ANNUAL SCIENTIFIC ASSEMBLY

San Francisco, March 28-31, 1965



Featured subject:

VIROLOGY

The current status of virus research
Applied virology
Treatment of virus diseases

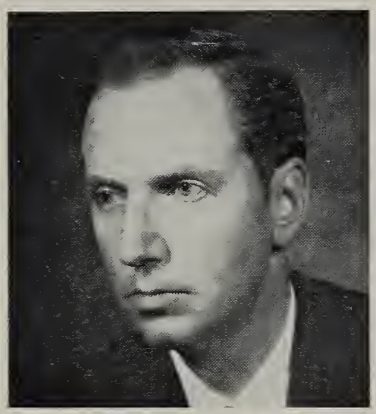


For Hotel Reservations, See Page 496

Among the outstanding speakers who will appear at the 1965 Annual Scientific Assembly



GEORGE GEE JACKSON, M.D.
Professor of Medicine,
University of Illinois College of
Medicine, Chicago, Illinois



IGOR TAMM, M.D.
Professor, The Rockefeller Institute
New York, New York



C. HENRY KEMPE, M.D.
Professor and Chairman, Department of
Pediatrics, University of Colorado
School of Medicine, Denver, Colorado



ROBERT RODERICK WAGNER, M.D.
Professor of Microbiology and Head of
Virology Division, The Johns Hopkins
University School of Medicine
Baltimore, Maryland



HILARY KOPROWSKI, M.D.
Director, The Wistar Institute of
Anatomy and Biology
Philadelphia, Pennsylvania

Make your plans now to attend this outstanding medical event. Meetings will be held at the Fairmont and Mark Hopkins Hotels.

CMA

CALIFORNIA MEDICAL ASSOCIATION

application
for **HOTEL ACCOMMODATIONS**

94th
ANNUAL SESSION

CALIFORNIA
MEDICAL
ASSOCIATION

March 28-31, 1965

FAIRMONT & MARK HOPKINS HOTELS

SAN FRANCISCO

House of Delegates Opening Session, Saturday evening, March 27, Mark Hopkins Hotel; Scientific Sessions and Exhibits, Fairmont Hotel, begin Sunday morning, March 28.

Information

1. Please fill in the form below **completely** for room accommodations at the CMA's 1965 Annual Session. There is only a limited number of rooms available. Your choice of accommodations will be better if your request is for rooms to be occupied by two or more persons.
2. Your reservation request should include the **definite date and hour** of your arrival and departure.
3. Reservations can only be held until 6:00 p.m.
4. **All reservations must be made through the CMA Housing Bureau, Department 34, 693 Sutter Street, San Francisco, California 94102.**
5. **DEADLINE** for housing: March 1, 1965.

Hotel Room Rates*

	Single	Twin Beds	Suites
MARK HOPKINS	$17.00—23.00	$21.00—28.00	$40.00—80.00
FAIRMONT	17.00—25.00	22.00—36.00	40.00—up
FAIRMONT TOWER	26.00—32.00	31.00—37.00	65.00—150.00
HUNTINGTON	14.00—25.00	18.00—25.00	40.00 & 50.00
SHERATON-PALACE	13.00—17.00	17.00—21.00	25.00—35.00 up
ST. FRANCIS	13.00—26.00	18.00—29.00	32.00—55.00
SIR FRANCIS DRAKE	12.00—18.00	18.00—22.00	49.00—up
JACK TAR	15.00—28.00	19.00—30.00	34.00—89.00
S. F. HILTON	12.00—23.00	18.00—27.00	44.00—up

*The prices quoted are existing rates, but are subject to change.

California Medical Association—Housing Bureau, Department 34
693 Sutter Street, San Francisco, California 94102

Please reserve the following accommodations for the 94th Annual Session of the California Medical Association in San Francisco, March 28-31, 1965. The first meeting of the House of Delegates begins Saturday evening, March 27, at the Mark Hopkins Hotel.

Single Room $.....Twin-Bedded Room $.....Other.....

Small Suite $.....Large Suite $.....Other.....

First Choice Hotel.....Second.....

Arrival (date).....Hour.....a.m.....p.m.....
Departure (date).....Hour.....a.m.....p.m..... } Hotel reservations only held until 6:00 p.m.

THE NAME OF EACH HOTEL GUEST MUST BE LISTED. Therefore, please include the names and addresses of both persons for each twin-bedded room requested; and names and addresses of all other persons for whom you are requesting reservations, and who will occupy the rooms asked for:

.....

.....

.....

.....

Individual Requesting Reservations—PLEASE PRINT OR TYPE:

Name:.....Are you a CMA Officer?.....Delegate?.....Alternate?.....

Address:.....County.....

City and State.....Zip No.....

In Memoriam

Adams, Hugh, Camarillo. Died October 13, 1964, in Oxnard, aged 41, of heart disease. Graduate of Vanderbilt University School of Medicine, Nashville, Tennessee, 1948. Licensed in California in 1951. Doctor Adams was a member of the Ventura County Medical Society.

✤

Allison, Ray L., Hollywood. Died October 24, 1964, in Burbank, aged 55, of coronary occlusion. Graduate of the University of Pittsburgh School of Medicine, Pennsylvania, 1931. Licensed in California in 1938. Doctor Allison was a member of the Los Angeles County Medical Association.

✤

Altenes, James J., Torrance. Died October 17, 1964, in Utah, aged 43, of a coronary. Graduate of the Kansas City College of Osteopathy and Surgery, Kansas City, Missouri, 1959. Licensed in California in 1960. M.D. degree from California College of Medicine, 1962. Doctor Altenes was an affiliate member of the Forty First Medical Society.

✤

Barritt, John L., San Francisco. Died October 20, 1964, in Novato, aged 67, of heart disease. Graduate of Creighton University School of Medicine, Omaha, Nebraska, 1927. Licensed in California in 1939. Doctor Barritt was an associate member of the San Francisco Medical Society.

✤

Blahnik, Karel Bartholomae, Pasadena. Died October 13, 1964, in Pasadena, aged 78, of myocardial infarction. Graduate of Northwestern University Medical School, Chicago, Illinois, 1911. Licensed in California in 1923. Doctor Blahnik was a retired member of the Los Angeles County Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✤

Childers, Leland A., San Jose. Died October 29, 1964, in San Jose, aged 64. Graduate of Tulane University School of Medicine, New Orleans, Louisiana, 1926. Licensed in California in 1927. Doctor Childers was a member of the Santa Clara County Medical Society.

✤

Craft, Otis Raymond, San Francisco. Died August 19, 1964, in San Francisco, aged 73. Graduate of the University of Cincinnati College of Medicine, Ohio, 1923. Licensed in California in 1930. Doctor Craft was a member of the San Francisco Medical Society.

✤

Curtis, Charles Havelock, Los Angeles. Died October 8, 1964, in Bakersfield, aged 67, of myocardial infarction. Graduate of Eclectic Medical College, Cincinnati, Ohio, 1926. Licensed in California in 1926. Doctor Curtis was a member of the Los Angeles County Medical Association.

✤

Ellmore, Lewis Francis, Orange. Died October 3, 1964, in Venice, Italy, aged 59. Graduate of New York University College of Medicine, New York, 1929. Licensed in California in 1940. Doctor Ellmore was an associate member of the Orange County Medical Association.

Graves, John Maddux, Belvedere. Died October 22, 1964, in Belvedere, aged 71, of heart disease. Graduate of Stanford University School of Medicine, Palo Alto-San Francisco, 1920. Licensed in California in 1920. Doctor Graves was a retired member of the San Francisco Medical Society and the California Medical Association, and an associate member of the American Medical Association.

✤

Hanlon, Harold Hudson, Los Angeles. Died October 31, 1964, in Los Angeles, aged 65. Graduate of General Medical College, Chicago, Illinois, 1923. Licensed in California in 1924. Doctor Hanlon was a member of the Los Angeles County Medical Association.

✤

Heydenreich, Mortimer H., Fontana. Died October 22, 1964, in Fontana, aged 56. Graduate of the College of Osteopathic Physicians and Surgeons, Los Angeles, 1939. Licensed in California in 1939. M.D. degree from California College of Medicine, 1962. Doctor Heydenreich was a member of the Forty First Medical Society.

✤

Jackson, Gregory Robert, Los Angeles. Died October 9, 1964, in Los Angeles, aged 63, of acute coronary occlusion. Graduate of Latvijas Universitäte, Medicinas Fakultäte, Riga, Latvia, 1929. Licensed in California in 1952. Doctor Jackson was a member of the Los Angeles County Medical Association.

✤

Jobbins, Charles George, Santa Barbara. Died August 6, 1964, aged 61, of adenocarcinoma of the appendix. Graduate of the University of Cambridge Faculty of Medicine, Cambridge, England, 1928. Licensed in California in 1939. Doctor Jobbins was a retired member of the Santa Barbara County Medical Society and the California Medical Association, and an associate member of the American Medical Association.

✤

Kelker, George David, Crystal City, Texas. Died October 19, 1964, in Crystal City, aged 72. Graduate of Stanford University School of Medicine, Palo Alto-San Francisco, 1919. Licensed in California in 1919. Doctor Kelker was a member of the San Luis Obispo County Medical Society, a life member of the California Medical Association, and a member of the American Medical Association.

✤

Mooser, Charles Edward, Oakland. Died October 16, 1964, in Oakland, aged 99. Graduate of Cooper Medical College, San Francisco, 1901. Licensed in California in 1901. Doctor Mooser was a retired member of the Alameda-Contra Costa Medical Association and the California Medical Association, and an associate member of the American Medical Association.

✤

Payne, DeWalt, Whittier. Died October 6, 1964, in Whittier, aged 64, of pulmonary emphysema, arteriosclerosis.

Graduate of Northwestern University Medical School, Chicago, Illinois, 1926. Licensed in California in 1927. Doctor Payne was a member of the Los Angeles County Medical Association.

✤

Pierce, Horace F., Santa Barbara. Died October 31, 1964, in Santa Barbara, aged 75. Graduate of the University of Colorado School of Medicine, Denver, 1913. Licensed in California in 1913. Doctor Pierce was a member of the Santa Barbara County Medical Society.

✤

Quinn, William Russell, Redlands. Died November 3, 1964, in San Bernardino, aged 67. Graduate of Jefferson Medical College of Philadelphia, Pennsylvania, 1922. Licensed in California in 1930. Doctor Quinn was a member of the San Bernardino County Medical Society.

✤

Salisbury, Peter Frederic, Burbank. Died November 5, 1964, in Burbank, aged 51, of heart disease. Graduate of Regia Università degli Studi di Roma; Facoltà di Medicina e Chirurgia, Italy, 1937. Licensed in California in 1942. Doctor Salisbury was a member of the Los Angeles County Medical Association.

Suglian, Vinko Vladmir, San Francisco. Died October 10, 1964, in San Francisco, aged 63. Graduate of Medecinski Kakultet Zagrebaskog, Universiteta, Zagreb, Yugoslavia, 1927. Licensed in California in 1935. Doctor Suglian was a member of the San Francisco Medical Society.

✤

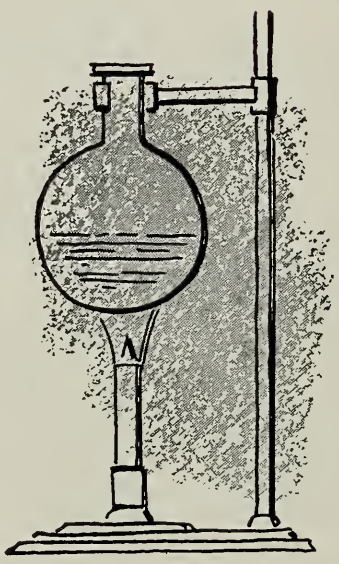
Warren, Joseph W., Los Angeles. Died November 6, 1964, in Palm Springs, aged 82. Graduate of Queen's University Faculty of Medicine, Kingston, Ontario, Canada, 1905. Licensed in California in 1925. Doctor Warren was a member of the Los Angeles County Medical Association.

✤

West, Leonard Albert, Palos Verdes Estates. Died October 13, 1964, in Palos Verdes Estates, aged 70, of heart disease. Graduate of the State University of Iowa College of Medicine, Iowa City, 1919. Licensed in California in 1930. Doctor West was an associate member of the Los Angeles County Medical Association.

✤

Wigod, David, Long Beach. Died November 8, 1964, aged 60. Graduate of Marquette University School of Medicine, Milwaukee, Wisconsin, 1928. Licensed in California in 1931. Doctor Wigod was a member of the Los Angeles County Medical Association.



PUBLIC HEALTH REPORT

MALCOLM H. MERRILL, M.D., M.P.H.
Director, State Department of Public Health

THE IMPACT of the 1963-64 influenza season was limited almost entirely to the Pacific Coast states. The first outbreaks occurred in January in communities in Washington. Spread throughout Washington and Oregon was rapid and the presence of epidemic influenza was soon evident in California.

The predictions for the current season are optimistic. Past observations suggest that epidemic influenza A tends to occur over a two to three-year cycle with an occasional hiatus of a five-year period. The last upcurve was in 1963. Influenza B shows a recurrent cycle of four to six years, and its last major appearance in California was during the 1961-62 cycle.

Recent reports, however, state that clusters of febrile respiratory illness have been reported in Oregon. Acute and convalescent sera from five clinically suspected cases of influenza have shown significant antibody reaction to A2 influenza. Thus, although it is unlikely that California will experience a major outbreak this season, focal outbreaks and scattered sporadic cases may occur.

To date, preliminary data indicate school absenteeism to be within the seasonal norm of 4 to 6 per cent. Data on admission to the medical service of Cowell Memorial Hospital (at University of California, Berkeley) on respiratory illness seen by physicians in Colusa County and on industrial absenteeism are normal for the season. Laboratory tests so far have been negative.

* * *

Approximately 170 cases of Salmonellosis associated with hospitalization have come to attention in California through September. Nine institutions and four Salmonella serotypes have been involved. It is felt this is but a small portion of the problem, and that many more cases are occurring but are unrecognized. As with many other infectious diseases, the problem of the asymptomatic carrier plays a major role in understanding this difficult situation.

A brief review of all reported instances of Salmonella infection occurring within one county during 1962 and 1963 indicated that at least 5 to 10 per cent of these cases were hospital-acquired, as either part of an outbreak or as sporadic cases.

There have been a variety of outbreaks, including the explosive common source types, and those which can extend over a longer period. In some instances, the chain of infection has been well defined and in others the mode of spread has remained in doubt.

In evaluating any case of hospital-acquired Salmonellosis, attention must be paid to dietary constituents and their relation, however obscure, to raw animal products, to equipment and materials utilized in both diagnostic and therapeutic procedures, and to any and all personnel in contact with patients.

The hospital population is, in part, composed of many persons highly susceptible to infections of any sort, and the complications of these problems are frequently serious. The problem, it is noted, does not remain confined to the hospital environment but extends into the community as the disease spreads to involve extra-hospital contacts of persons infected with Salmonella.

The department's Bureau of Communicable Diseases urges prompt and complete reporting of all cases of hospital-acquired Salmonella infection. Within the limits of available time and personnel, the department will furnish epidemiological assistance.

* * *

State and federal matching funds totaling $22,543,390 will be allocated for the construction of community hospital facilities in California this year. The funds will be allocated on a basis of area priority throughout the state in six categories: general and psychiatric hospitals, long-term care facilities, public health centers, rehabilitation facilities, and diagnostic and treatment centers.

The state-federal funds provide two-thirds financing. The applicant provides the remaining one-third of project costs. The federal funds, matched by the state, are appropriated annually by Congress under the Hospital Survey and Construction Act.

NEWS & NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

The Ninth Annual Midwinter **Symposium of the Los Angeles County Heart Association** will be held on Wednesday, January 20, at the Statler Hilton Hotel. The program includes 18 papers on the latest in significant local heart research. Each of the nationally known research centers within Los Angeles County will be represented by medical scientists. Further information may be obtained from the Los Angeles County Heart Association, 2405 W. Eighth Street, Los Angeles 90057. The phone number is 385-4231.

* * *

Dr. Sol Baker, Los Angeles, was reelected president of the California Division of the American Cancer Society for a third term at the annual meeting of the organization in November.

SAN DIEGO

Dr. Sam Peck, San Diego, was elected president-elect of the San Diego County Medical Society in balloting last month. In January 1966 he will become president, succeeding Dr. John W. Flaiz of Escondido who will serve in that office for the year 1965.

Dr. William C. Herrick of El Cajon was elected secretary and Dr. Roy K. Tanaka, San Diego, was reelected treasurer.

SAN FRANCISCO

Dr. Edgar Wayburn will be installed as president of the San Francisco Medical Society January 1, succeeding Dr. John B. Schaupp, and Dr. George K. Herzog, Jr., has been elected president-elect.

Dr. Martha E. Mottram was elected treasurer and Dr. Nicholas Bonfilio secretary.

* * *

Dr. E. Horace Klabunde was elected president-elect of the American Society of Plastic and Reconstructive Surgeons at the annual meeting of the organization in November.

* * *

Nominations are being accepted for the **Doctor J. Elliott Royer Award,** to be presented annually by the University of California to the San Francisco or East Bay physician who, during the previous year, "shall have made the most significant contribution to psychiatry and neurology."

Dean William O. Reinhardt has announced the following **nomination procedure** for the first Royer Award:

1. Letters of Recommendation, setting forth in detail the reasons for the nomination, should be submitted by February 1, 1965, to the Royer Award Committee, Office of the Dean, University of California School of Medicine, San Francisco 94122.

2. Nominees must be actively engaged in the practice of medicine in San Francisco, Contra Costa or Alameda County, but not necessarily on a full-time basis. A physician whose main professional location is elsewhere would be eligible for nomination on the basis of a hospital staff membership, teaching appointment, consultantship, or similar part-time activity in one of the three designated counties.

Meningitis

Apparently patients of California physicians want to know more about the current outbreak of meningitis than they are getting in most newspapers.

Last Month's issue of the CMA *Newsletter* carried a story on a new *Health Tip* prepared by the California Medical Association which explains causes and treatment of the disease in laymen's terms.

By the first of December, 5,009 copies of the Tip —"What Is Meningitis?"—had been requested by CMA members. It makes good reading in their waiting rooms. More are available from Health Tip, CMA, 693 Sutter Street, San Francisco 94102.

GENERAL

Possible **reduction in the scope of state medical care programs** will be considered at a public hearing to be held by the State Department of Social Welfare in Sacramento Tuesday, December 22.

The hearing was scheduled because current expenditures in these programs are exceeding the budget limitations for this fiscal year.

The California Medical Association will be represented at the hearing, which will be held in Department headquarters, Motor Vehicle Building, 2415 First Avenue, starting at 9 a.m. Any CMA members interested are invited to attend.

Proposed reductions will pertain mainly to the Department's medical care program for adults. Consideration will be given to some reductions in drug formularies and to limitations in the rehabilitation program and in aid to the totally disabled.

Also under discussion will be the possibility of initiating limited co-payment for medical care by recipients and inclusion of eye care and eye glasses in the Dependent Children's Program.

* * *

The State Department of Public Health hopes to have a state-wide system of voluntary **phenylketonuria testing** in operation by next spring.

The system, which would utilize six regional laboratories for the tests, was endorsed in general principle last month by the California Medical Association's Scientific Board.

Dr. Robert Day, chief of the State Department of Public Health's recently-formed Hereditary Defects Unit, said specific recommendations are being compiled, and that so far head pathologists at the laboratories which would participate in the program and California Hospital Association officials contacted by the Department "are enthusiastic."

Dr. Day said pathologists have discussed testing procedures and have tentatively agreed on **a charge of $3 per test.** The cost would include a follow-up Guthrie test, if indicated.

The program is intended to provide testing services for hospital staffs that prefer not to do the testing themselves. The department hopes to see PKU tests eventually given to all babies born in the state.

* * *

The International Society for Comprehensive Medicine will have its Western Regional Meeting in Scottsdale, Arizona, January 8-10, 1965, at the Mountain Shadows Resort.

Further information may be obtained from T.E.A. von Dedenroth, M.D., 1800 East Speedway, Tucson, Arizona.

EDUCATION NOTICES

Meetings and Courses

COMMITTEE ON CONTINUING MEDICAL EDUCATION

THIS BULLETIN of the dates of continuing education programs and the meetings of various medical organizations in California is supplied by the Committee on Continuing Medical Education of the California Medical Association. In order that they may be listed here, please send communications relating to your future meetings or postgraduate courses to Committee on Continuing Medical Education, California Medical Association, 693 Sutter Street, San Francisco, California 94102.

Medical Meetings

JANUARY MEETINGS

January 4-8—**Stroke and the Cerebrovascular Diseases.** Presented by the American College of Physicians. Rancho Los Amigos Hospital, Downey. Monday-Friday. Contact: Edward C. Rosenow, Jr., M.D., executive director, The American College of Physicians, 4200 Pine Street, Philadelphia, Pa. 19104.

January 14—**American Federation for Clinical Research Annual Symposium: "Recent Research on Behavior."** San Francisco Medical Society, 250 Masonic, San Francisco. Thursday, 8:00 p.m. Contact: M. Silvija Hoag, M.D., Hematology Research Laboratory, Children's Hospital, San Francisco.

January 16—**Annual Symposium on Heart Disease.** Orange County Medical Association Building, 300 South Flower, Orange. Saturday. Contact: Howard G. Buswell, executive director, Orange County Heart Association, P.O. Box 1704, Santa Ana 92703.

January 20—**Annual Midwinter Symposium on Heart Disease.** Statler Hilton Hotel, Los Angeles. Wednesday. Contact: Mr. Chauncey Alexander, executive director, Los Angeles County Heart Association, 2405 West 8th Street, Los Angeles 90057.

January 22-24—**Annual Meeting of the Southern California Chapter, American College of Surgeons.** Palm Springs. Sunday-Tuesday. Contact: Russell Smith, M.D., chairman, 1930 Wilshire Blvd., Los Angeles.

January 27-28—**The American Group Psychotherapy Association Annual Training Institute: "Formation and Conduct of Psychotherapy Groups in Various Existing Settings."** Jack Tar Hotel, San Francisco. Wednesday-Thursday. Contact: Max A. Sherman, M.D., chairman, 1022 S. La Cienega Blvd., Los Angeles 90035.

January 28-30—**The American Group Psychotherapy Association Annual Scientific Conference.** Jack Tar Hotel, San Francisco. Thursday-Saturday. Contact: American Group Psychotherapy Association, Inc., 1790 Broadway, Room 516, New York 19, N.Y.

January 29-31—**Clinical Conference in Pediatric Anesthesiology.** Childrens Hospital of Los Angeles. Friday-Sunday. Contact: M. Digby Leigh, M.D., Childrens Hospital of Los Angeles, 4614 Sunset Boulevard, Los Angeles 90027.

January 30-31—**Annual Midwinter Radiological Conference.** Biltmore Hotel, Los Angeles. Saturday-Sunday. Contact: John L. Gwinn, M.D., Children's Hospital, 4614 Sunset Boulevard, Los Angeles 90027.

January 30-31—**Memorial Hospital Scientific Seminar Program.** Memorial Hospital of Southern California, 3828 Hughes Avenue, Culver City. Saturday-Sunday. Contact: Charles Kruse, M.D., chairman, 2200 Santa Monica Blvd., Santa Monica.

FEBRUARY MEETINGS

February 13-14—**Pediatric Surgery Symposium.** Presented by Childrens Hospital of Los Angeles. Saturday-Sunday. Contact: Newlin Hastings, M.D., program chairman, 4614 Sunset Blvd., Los Angeles 90027.

February 20-21—**Pediatric Urologic Seminar.** Childrens Hospital, Los Angeles. Saturday-Sunday. Contact: H. H. Edelbrock, M.D., 6753 Hollywood Blvd., Los Angeles 90028.

MARCH MEETINGS

March 7-11—**Alumni Postgraduate Convention, Loma Linda University School of Medicine.** March 7-8 (Sunday-Monday)—Refresher Courses. White Memorial Medical Center. March 9-11 (Tuesday-Thursday)—Scientific Assembly. Ambassador Hotel. Contact: Samuel H. Fritz, M.D., general chairman, 1832 East Michigan, Los Angeles 90033.

March 15-19—**Advanced Electrocardiography and Vectorcardiography.** Co-sponsored by the Daniel Freeman Hospital and the Los Angeles County Heart Association. Wednesday through Friday evenings at the Daniel Freeman Hospital, Inglewood. Registration fee: $50. Contact: Walter S. Graf, M.D., program chairman, The Daniel Freeman Hospital, 333 N. Prairie Avenue, Inglewood.

March 17-18—**Cancer Seminar.** Sponsored by the Arizona Division of the American Cancer Society. Pioneer Hotel, Tucson. Wednesday-Thursday. Contact: Darwin W. Neubauer, M.D., 720 North Country Club Road, Tucson 85716.

March 24-25—**Annual Cardiovascular Symposium for the Physician Practicing General Medicine.** Statler Hilton Hotel, Los Angeles. Wednesday-Thursday. Contact: Marvin J. Rosenburg, M.D., chairman, 4314 W. Slauson, Los Angeles 90043.

March 28-31—**CALIFORNIA MEDICAL ASSOCIATION 94th Annual Session.** Scientific theme: "Virology." Fairmont Hotel, Mark Hopkins Hotel, San Francisco. Sunday-Wednesday. Contact: Mr. John Hunton, executive secretary, 693 Sutter Street, San Francisco 94102.

APRIL MEETINGS

April 2-4—**American Society for the Study of Sterility.** San Francisco. Friday-Sunday. Contact: Herbert H.

Thomas, M.D., executive secretary, 944 S. 18th Street, Birmingham, Alabama.

April 2-4—**Annual Postgraduate Assembly in Anesthesiology.** Sponsored by the Anesthesia Section of the Los Angeles County Medical Association. International Hotel, Los Angeles. Friday-Sunday. $20. Contact: Joseph L. Cadranel, M.D., secretary, 9430 Kirkside Road, Los Angeles 90035.

April 4-8—**Annual Clinical Meeting of the American College of Obstetricians and Gynecologists.** Civic Auditorium, San Francisco. Sunday-Thursday. Contact: Robert A. Kimbrough, M.D., director, 79 West Monroe Street, Chicago 60603.

April 9-15—**American Academy of General Practice.** San Francisco. Friday-Thursday. Contact: Mac F. Cahal, J.D., Volker Boulevard at Brookside, Kansas City 12, Mo.

Postgraduate Education

Audio-Digest Foundation

Audio-Digest Foundation (a non-profit subsidiary of the California Medical Association) provides by subscription twice-a-month tape-recorded summaries of leading national meetings and authoritative surveys of current literature. Seven separate services in: General Practice, Surgery, Internal Medicine, Obstetrics-Gynecology, Pediatrics, Anesthesiology, and Ophthalmology. A new Catalog of outstanding lectures and panel discussions in all areas of medical practice is also available. For information, write: Mr. Claron L. Oakley, Editor, 619 South Westlake Avenue, Los Angeles.

Presbyterian Medical Center

January 9—**Office Diagnosis and Treatment.** Saturday. 8 hours. $25.

January 23—**Diabetes Mellitus.** Saturday. 8 hours. $25.

February 6—**Current Dermatologic Therapy.** Saturday. 8 hours. $25.

March 3-5—**Keratoplasty.** Lions Eye Bank, Presbyterian Medical Center. Wednesday-Friday. 24 hours. $125. Limited to specialists.

March 6-7—**Operable Heart Disease Annual Conference.** Saturday-Sunday. 16 hours. $35.

March 13-14—**Cancer Conference.** Saturday-Sunday. 16 hours. $25.

March 20—**Treatment of Fractures.** Saturday. 8 hours. $25.

March 27—**Progress in Pediatrics.** Saturday. 8 hours. $25.

For information contact: Arthur Selzer, M.D., chairman, Education Committee, Presbyterian Medical Center, Clay and Webster Streets, San Francisco 94115. WEst 1-8000.

University of California at Los Angeles

January 13-17—**Controversial Areas in Surgery.** Riviera Hotel, Palm Springs. Wednesday-Sunday. 16 hours. $100.

January 13-May 12—**Teaching Clinics in Psychiatry.** Wednesday evenings. 36 hours. $25.

January 17-20—**Chemotherapy.** Riviera Hotel, Palm Springs. Sunday-Wednesday. 12 hours. $100.

February 1-2—**Practical Application of Neuroradiological Techniques.** Monday-Tuesday. 12 hours. $50.

February 3-7—**Gastroenterology.** Riviera Hotel, Palm Springs. Wednesday-Sunday. 16 hours. $100.

February 6-7—**Venereal Disease.** Saturday-Sunday. 12 hours.*

February 11-April 1—**Bedside Clinics in Internal Medicine.** Harbor General Hospital, Torrance. Thursday evenings. 16 hours. $60.

February 12-14—**Geriatric Anesthesia.** Harbor General Hospital, Torrance. Friday-Sunday. 18 hours.*

February 17-April 7—**Medical Economics.** Wednesdays. 16 hours. $35.

February 27-28—**Early Management of Acute Trauma.** Saturday-Sunday. 12 hours.*

February 20—**Concepts of Mental Health Consultation.** Saturday. 7 hours. $25.

March 6-7—**Surgical Techniques for Degenerative Hip Disease.** Saturday-Sunday. 12 hours.*

March 12-14—**Cardiology.** Friday-Sunday. 16 hours.*

April 5-16—**Prosthetics-Orthotics.** Monday-Friday. 90 hours. $200.

April 7-10—**Emergency Care of the Sick and Injured.** Wednesday-Saturday. 24 hours. $20.

May 3-4—**Surgery of the Head and Neck.** Monday-Tuesday. 12 hours.*

May 6-7—**Diseases of the Larynx.** Thursday-Friday. 12 hours.*

May 13-16—**The Arterial Tree.** Thursday-Sunday. 24 hours.*

May 21-23—**Laboratory Diagnosis.** Friday-Sunday. 18 hours.*

May 31-June 11—**Prosthetics-Orthotics.** Monday-Friday. 90 hours. $200.

For information on courses for physicians or ancillary personnel contact: Thomas H. Sternberg, M.D., Assistant Dean and Head, Department of Continuing Education in Medicine and Health Sciences, U.C.L.A. Medical Center, Los Angeles 90024, 478-9711, Ext. 2114.

Loma Linda University

As Arranged—**Traineeships** in clinical and other departments are available by arrangement with department chairmen of the Postgraduate Division. 80 hours minimum.

Anesthesia, 6 months. 250-300 hours. $350.

Pulmonary Diseases—can be arranged.

Continuously—**Illustrated Medical Lectures:** 30-minute tape recordings and accompanying 35-mm filmstrip, 50 to 80 full-color pictures for screen, hand or desk viewer. Available individually or by subscription. 12 or 36 titles per year, all titles produced in one year in any chosen specialty. Projectors and viewers included in subscription plans. Contact: Loma Linda University, Illustrated Medical Lectures, Los Angeles 33.

For course information contact: W. F. Norwood, Ph.D., Assistant Dean and Chairman, Division of Continuing Education, Loma Linda University School of Medicine, 1720 Brooklyn Ave., Los Angeles, California 90033, ANgelus 9-7241, Ext. 214.

University of California, San Francisco

January 9—**Current Practices and Future Trends in Obstetrics.** Children's Hospital, San Francisco. Saturday.*†

*Fee to be announced.
†Hours to be announced.

January 9-February 13—**Postgraduate Seminars in Clinical Sciences.** Mercy Hospital. Saturday mornings. 12 hours. No fee.

January 16-17—**Biopsy and Aspiration Techniques in Diagnosis.** Saturday-Sunday.*†

January 19-April 6—**Medical Radio Conferences.** Tuesdays. 12:30 to 1:30 p.m.

January 21-April 8—**Medical Radio Conferences.** Thursdays. 12:30 to 1:30 p.m.

January 22-24—**The Challenge to Woman: The Biologic Avalanche.** Friday-Sunday.*†

January 27-April 14—**Practical Medical Psychotherapy.** Langley Porter Neuropsychiatric Institute, San Francisco.*†

February 1—**Medical Aspects of Well Being.** Monday. 9 hours. $10.

February 3-5—**Aviation Medicine Seminars.** Del Webb's TowneHouse, San Francisco. Wednesday-Friday.*†

February 6-March 13—**Conflicts in Sexual Adjustments.** Herrick Memorial Hospital, Berkeley. Saturdays. 18 hours. $10.

February 11-13—**Pediatric Ophthalmology.** Thursday-Saturday. 20 hours. $65.

February 13-14—**Neuropsychiatry in General Practice.** Napa State Hospital. Saturday-Sunday.*†

February 15-19—**Course for Physicians in General Practice.** Mount Zion Hospital, San Francisco. Monday-Friday. 32 hours. $100.

February 18-March 25—**Neuropsychiatry in General Practice.** Napa State Hospital, Imola.*†

February 18-20—**Skin Bacteria and Their Role in Infection.** Thursday-Saturday. 15 hours. $35.

February 20-22—**Selecting Children for Special Educational Services.** Saturday-Monday. 18 hours. $15.

February 26-27—**Clinical Neurology.** Friday-Saturday.*†

February 27-28—**Neuropsychiatric Management in Daily Practice.** Modesto State Hospital, Modesto. Saturday-Sunday.*†

March 10-14—**Diagnostic Radiology.** Wednesday-Sunday. 26 hours. $110.

March 13—**Demonstrations in Clinical Hematology.** Children's Hospital, San Francisco. Saturday. 6 hours. $15.

March 13-14—**Neuropsychiatry in Daily Practice.** Agnews State Hospital, San Jose. Saturday-Sunday.*†

March 19-21—**Sex Disorders in Clinical Practice: A Program for Physicians.** Friday-Sunday. 20 hours. $75.

April 2-4—**Proctology.** Friday-Sunday.*†

April 7-May 12—**Psychiatry for General Practice.** Stockton State Hospital, Stockton.*†

April 10-11—**Clinical Considerations in Mental Retardation.** Sonoma State Hospital, Eldridge. Saturday-Sunday.*†

April 10-11—**The Uncertain Quest: The Teen-Ager's World.** Saturday-Sunday.*†

April 22-24—**Inheritable Endocrine and Metabolic Diseases: Prevention, Detention, and Treatment.** Thursday-Saturday.*†

April 24-25—**Neuropsychiatry for the Non-Psychiatric Physician in General Practice.** Sutter Memorial Hospital, Sacramento. Saturday-Sunday.*†

April 29-May 1—**Ear, Nose, Throat.** Friday-Saturday.*†

April 30-May 1—**Pediatrics.** Friday-Saturday.*†

Continuously—Courses presented by special arrangement: **Anesthesia** (Full time for one to three weeks or part time by arrangement), **Dermatology** (Full time or part time by arrangement).

Principles and Clinical Uses of Radioisotopes (full time, one to three months).

For information on courses for physicians or ancillary personnel, contact: Seymour M. Farber, M.D., Assistant Dean, Dept. of Continuing Education in Medicine and Health Sciences, University of California Medical Center, Room 565-U, San Francisco 94122, MOntrose 4-3600, Ext. 179.

University of Southern California

January 6-March 10—**Psychosomatic Pediatric Case Conferences.** Children's Hospital. Wednesdays 8:00-10:00 p.m. 20 hours. $55.

January 8-10—**Adolescence.** El Mirador Hotel, Palm Springs. Friday-Sunday. 22 hours. $60.

January 21-22—**New and Old Antibiotics.** Los Angeles County Hospital. Thursday-Friday. 15 hours. $35.

January 29—**Nuclear Medicine.** Los Angeles County Hospital. Fridays, 4:00-5:00 p.m.

February 2-April 20—**Bedside Cardiology.** Los Angeles County Hospital. $80.†

February 12-14—**Spatial Electrocardiography.** El Mirador Hotel, Palm Springs. Friday-Sunday. 22 hours. $60.

February 19-21—**Neurological Procedures and Principles Useful in Internal Medicine.** Los Angeles County Hospital. Friday-Sunday. 22 hours. $65.

February 24—**Shock Symposium.** Statler Hilton Hotel, Los Angeles. Wednesday. 7 hours. $25.

February 25-26—**Pulmonary Disease.** Beverly Hilton Hotel, Beverly Hills. Thursday-Friday. 14 hours. $45.

March 3-May 19—**Introduction to Family Therapy.** Los Angeles County Hospital. Wednesdays. 24 hours. $35.

March 3-May 19—**Doctor-Patient Communication: A Laboratory Course.** Los Angeles County Hospital. Wednesdays. 24 hours. $25.

April 8-June 10—**Ward Walks in Rare Diseases.** Los Angeles County Hospital. Thursdays. 20 hours. $105.

April 8-9—**Current Concepts in Obstetrics and Gynecology.** Statler Hilton Hotel, Los Angeles. Thursday-Friday. 14 hours. $45.

May 29-June 30—**Fourth Annual Medical Centers of Europe.** $250.

June 23-25—**Treatment of Fractures.** Los Angeles County Hospital. Wednesday-Friday. 22 hours. $80.

Continuously—**Basic Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $100. Physicians may register at any time.

Continuously—**Advanced Home Course in Electrocardiography.** One year postgraduate series, ECG interpretation by mail. Fifty-two issues $85. Physicians may register at any time.

For course information contact: Phil R. Manning, M.D., Assoc. Dean, Postgraduate Division, USC School of Medicine, 2025 Zonal Ave., Los Angeles 90033, CApital 5-1511, Ext. 300.

California Medical Association

Committee on Continuing Medical Education
15th Annual Postgraduate Institutes, 1965

February 25-26—**SOUTHERN COUNTIES,** in cooperation with Stanford University School of Medicine. **"Advances in Therapeutics."** Disneyland Hotel, Anaheim. Chair-

man: Edward Shanbrom, M.D., Orange County General Hospital, 101 South Manchester, Orange.

March 12-13—**WEST COAST COUNTIES,** in cooperation with University of California School of Medicine, San Francisco. Del Monte Lodge, Pebble Beach. Chairman: William B. Wenner, M.D., 726 Cass Street, Monterey.

May 27-28—**SAN JOAQUIN COUNTIES,** in cooperation with USC School of Medicine. Ahwahnee Hotel, Yosemite. Chairman: Howard Corbus, M.D., 1300 North Fresno, Fresno.

June 24-26—**SACRAMENTO VALLEY COUNTIES,** in cooperation with UCLA School of Medicine. Harvey's Resort Hotel, Lake Tahoe. Co-Chairmen: Dixon L. Hughes, M.D., 3320 White Oak Court, Sacramento; Philip J. Reilly, M.D., 6437 Fair Oaks Boulevard, Carmichael.

July—**NORTH COAST COUNTIES,** in cooperation with Loma Linda University School of Medicine. Eureka Inn, Eureka. Chairman: J. Roy Wittwer, M.D., 716 Harris Street, Eureka.

For information regarding Postgraduate Institutes and Circuit Courses, Contact: Continuing Medical Education, California Medical Association, 693 Sutter Street, San Francisco 94102. PRospect 6-9400, Ext. 68.

TO HAVE YOUR MEETING OR PROGRAM LISTED IN CALIFORNIA MEDICINE

FILL OUT AND MAIL THIS BLANK TO THE ADDRESS GIVEN

(COPY MUST BE **RECEIVED** NOT LATER THAN THE **FIFTH OF THE MONTH PRECEDING** ISSUE)

Continuing Medical Education, California Medical Association
693 Sutter Street, San Francisco, California 94102

NAME OF ORGANIZATION_____

MEETING OR PROGRAM_____

DATE_____ TIME_____

PLACE_____ FEE, IF ANY_____

CONTACT FOR INFORMATION:_____
(give name, title, address)

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KEY TO ABBREVIATIONS USED

(BRP)—Bureau of Research and Planning; (CMA)—California Medical Association; (CR)—Case Report; (CS)—Cancer Studies; (Ed.)—Editorial; (I)—Information; (LE)—Letter to Editor; (Misc.)—Miscellaneous; (Or.)—Original Article; (PE)—Page End; (RSB)—Report of Scientific Board.

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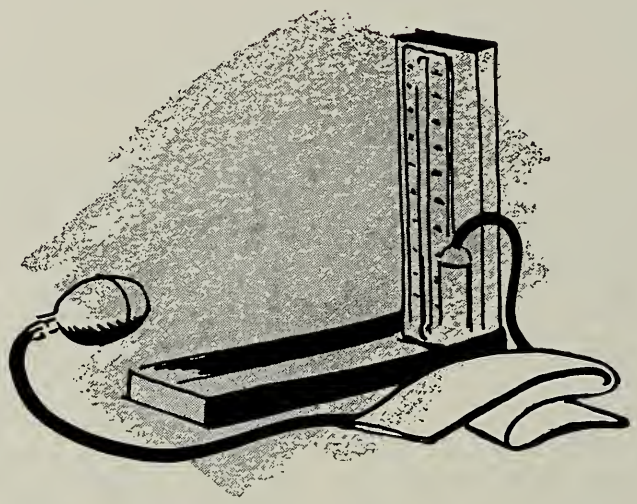
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1. Roach, T. C.: Therapy of Peptic Ulcer, J. Louisiana Med. Soc. *115*:136-139 (April) 1963.
2. Steinberg, H., and Almy, T. P., Drugs for Gastrointestinal Disturbances, Chapter 21, in Modell, W. (editor): Drugs of Choice —1964-1965, St. Louis, The C. V. Mosby Company, 1964, p. 343.

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Large Red Blood Cells Clue to Disease

Abnormally large red blood cells detected by laboratory techniques have proved to be a valuable clue to a variety of disorders, according to Dr. Paul G. Hattersley, Sacramento, Calif.

Using modern precise techniques, Dr. Hattersley studied all adults with large red blood cells admitted to Sutter General and Memorial Hospitals of Sacramento as well as the Sacramento Clinical Laboratories during the first three months of this year. Of the total of 120, 49 were men and 71 women. One-third of these patients were 65 years old or older.

In 32, no disorder commonly associated with large red blood cells could be diagnosed although many of these patients were quite ill, Dr. Hattersley reported in the Sept. 28 *Journal of the American Medical Association.*

In the remaining 88, evidence of one or more diseases was found, in many instances as a direct result of investigation prompted by the finding of the large red blood cells, he said.

Cirrhosis was the most frequent disorder encountered, occurring in 34 of the 88 patients. Cancer, including leukemia, made up the second largest group with 17 cases. Acute blood loss was found in 14 patients and anemia in 11.

Although heart and respiratory diseases are not generally regarded as causes of enlarged red blood cells, Dr. Hattersley pointed out, there were 10 patients in this group with congenital heart disease, heart failure, or emphysema.

Large red blood cells occur commonly in nonanemic individuals and further investigation of such patients not infrequently reveals serious and unsuspected disease, he concluded.

Study Size of Hospital, Staff In Psychiatric Care

(Continued from Page 12)

For all age and marital status categories, smaller hospitals had a higher rate of early releases than larger hospitals, the researchers also reported.

Smaller hospital size was particularly important with the patient group with the poorest likelihood of early release, men who had never married, they said, adding:

"The difference between small and large hospitals in the rate of early (release) . . . of older single men was, perhaps, the most impressive single finding of this study because these are the men most likely to become continuously hospitalized and forgotten."

The study was completed as an individual hospital project within the Veterans Administration Psychiatric Evaluation Project. Dr. Ullman is affiliated with the department of psychology, University of Illinois.

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Some Persons Allergic To Plain Water

Some persons are allergic to simple contact with water, two University of Pennsylvania researchers reported.

For years a distinctive form of hives marked by intense itching has been seen in certain individuals as a result of heat, emotion or exertion, Drs. Walter B. Shelley, a dermatologist, and Howard M. Rawnsley, a pathologist, Philadelphia, wrote in the September 21 *Journal of the American Medical Association.*

The common denominator in the development of these cases is "surface contact with sweat or even pure water," they said.

Extensive studies of three patients with typical cases showed that hives occurred after any contact with water or sweat in sensitive areas of the body. These areas generally were those rich in oil glands which usually open into hair follicles.

Interestingly, the authors related, stress or pain did not initiate hives. This is understandable, they said, because neither stress nor pain produced much perspiration. When exercise caused the patient to perspire, they added, hives resulted.

The mechanism whereby water on the surface of the skin precipitates hives and itching is not clear, the researchers said. However, they theorized that some toxic substance is formed by water acting on the oil gland or the oil secreted by the gland which leads to a release of histamine.

Attacks can be prevented by taking antihistamines or coating skin with oil, the physicians said.

Anti-Malarial Drug Used In 18 Suicides

Eighteen deaths due to overdoses of chloroquine phosphate, an anti-malarial drug, represent "a new problem in the field of suicide," according to an article in the October 26 *Journal of the American Medical Association.*

Thirteen deaths were described by Maj. Frank W. Kiel, MC, USA, Armed Forces Institute of Pathology, Washington, D.C., who said there had been five subsequent reports and other cases published previously in medical journals.

Twelve of the deaths reported by Maj. Kiel occurred in the Far East where chloroquine is widely used for preventing malaria. The other victim was an arthritic patient in this country being treated with the drug.

Suicide was the most likely explanation in all cases, Maj. Kiel said.

"Ready availability is one of the features of drug-induced poisonings," he warned. "In a drug of reputedly low toxicity, the use of chloroquine as a suicidal agent indicates that control of large supplies of the tablets should be maintained with care."

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—from a report by the President's Panel on Mental Retardation.

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German Measles in Pregnancy Confirmed By Lab Tests

Laboratory tests have been devised to determine whether a woman exposed to German measles during pregnancy actually contracted the infection, Dr. Stanley A. Plotkin, Philadelphia, reported.

The laboratory techniques were made possible by isolation of the virus which causes German measles in 1962, Dr. Plotkin wrote in the October 26 *Journal of the American Medical Association.*

Confirmation of German measles is of particular importance to an expectant mother because the disease, if contracted in the early stages of pregnancy, can cause mental retardation or other defects in the offspring.

Diagnosis of German measles is frequently difficult, Dr. Plotkin pointed out. It occurs in mild and atypical forms, he said, and the rash which accompanies other virus infections can be indistinguishable from that of German measles.

Confirmation or denial of the disease in the expectant mother can determine whether therapeutic abortion is to be considered.

Dr. Plotkin said his laboratory has been "deluged" with requests for help in such cases and suggested that public health laboratories might consider the development of similar services for their communities.

One drawback to the laboratory procedure at this time, he added, is the delay between the collection of nose and throat swabs and blood samples from the patient and the results of the tests, which varies from 10 days to three or four weeks.

However, he said, improved techniques which will sharply reduce this time period are now being developed and will be available in a year or two.

Dr. Plotkin reported on 24 women, exposed to the disease or suffering illnesses similar to German measles during pregnancy. The 24 cases were drawn from numerous women exposed during the epidemic which occurred in the eastern United States during the past winter and spring.

The cases demonstrated that the laboratory tests could be used to confirm the disease in order to exclude the possibility that an illness was caused by another agent: to confirm the disease when the symptoms were not typical; to attempt confirmation of recent infection when the patient was not seen by a physician during the rash: to determine whether an infection occurred after exposure to the disease when no symptoms became apparent; and to establish a more precise diagnosis of complications of German measles such as encephalitis.

The results indicated that evidence of German measles may be determined from a blood test if the first blood sample is obtained within two weeks of the onset of the rash and a second sample, two weeks later, according to the report.

Dr. Plotkin is with Wistar Institute of Anatomy and Biology and Children's Hospital, Philadelphia.

